Vol. XXVII FEBRUARY 1933 Number 2

EXCAVATING ENGINEER

FOUNDED 1905

Tropical trees clinging here and there to the bald knob above ... a spider web of pipe and air hose with men crawling like flies over the rock . . . the din of a score of jack hammers beating on your ear drums . . . a tough little shovel purring away as it piles the sharp fragments into trucks that roar away damward . . . this was the quarry for the Jerry O'Connell Dam at Bahia.

BUCYRUS ERIE

Type "U"

RED ARCH

Use its light weight to increase capacity of your present dragline

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DRAINAGE AND IRRIGATION
LIGHT, GENERAL EXCAVATION

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Ask for descriptive bulletin.

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GREDAG removes danger of scoring after a period of shut-down. It is the ideal lubricant for equipment being placed in service after weeks of idleness and exposure to the weather.

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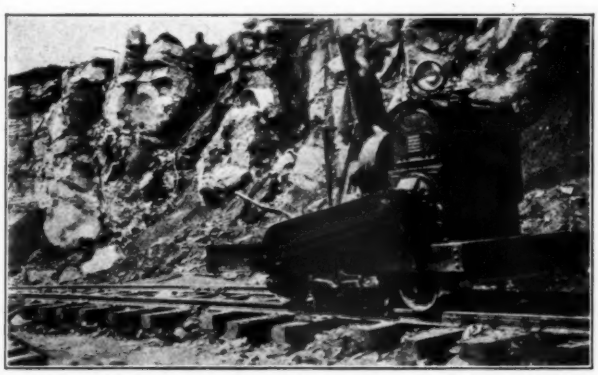

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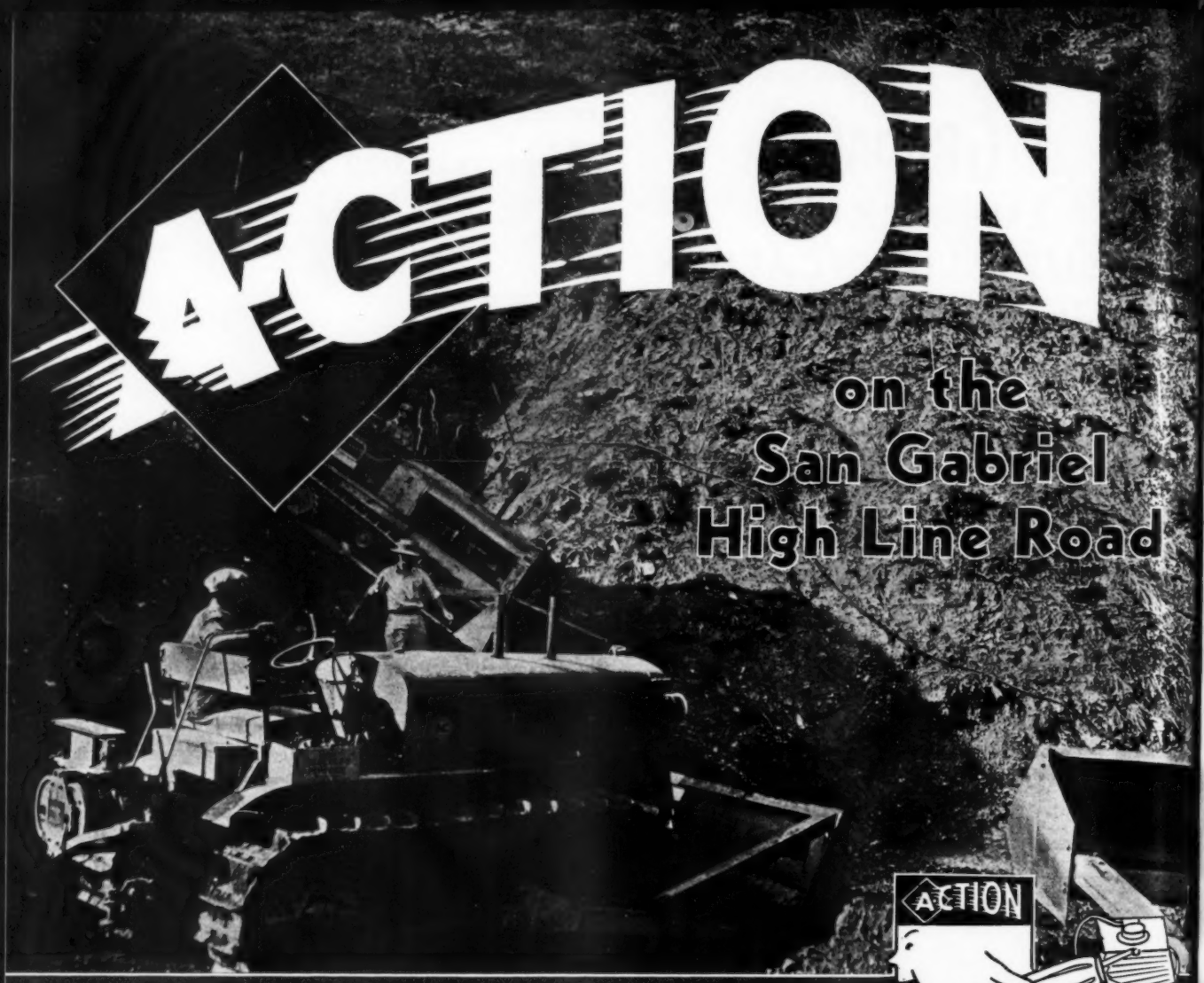

TEN Allis-Chalmers Tractors, nine model "Ls" and one model "35" operating rooters, bulldozers, cow-dozers, sheep foot rollers, and double drum winches in carving the High Line road out of the San Gabriel Mountains — are furnishing plenty of ACTION.

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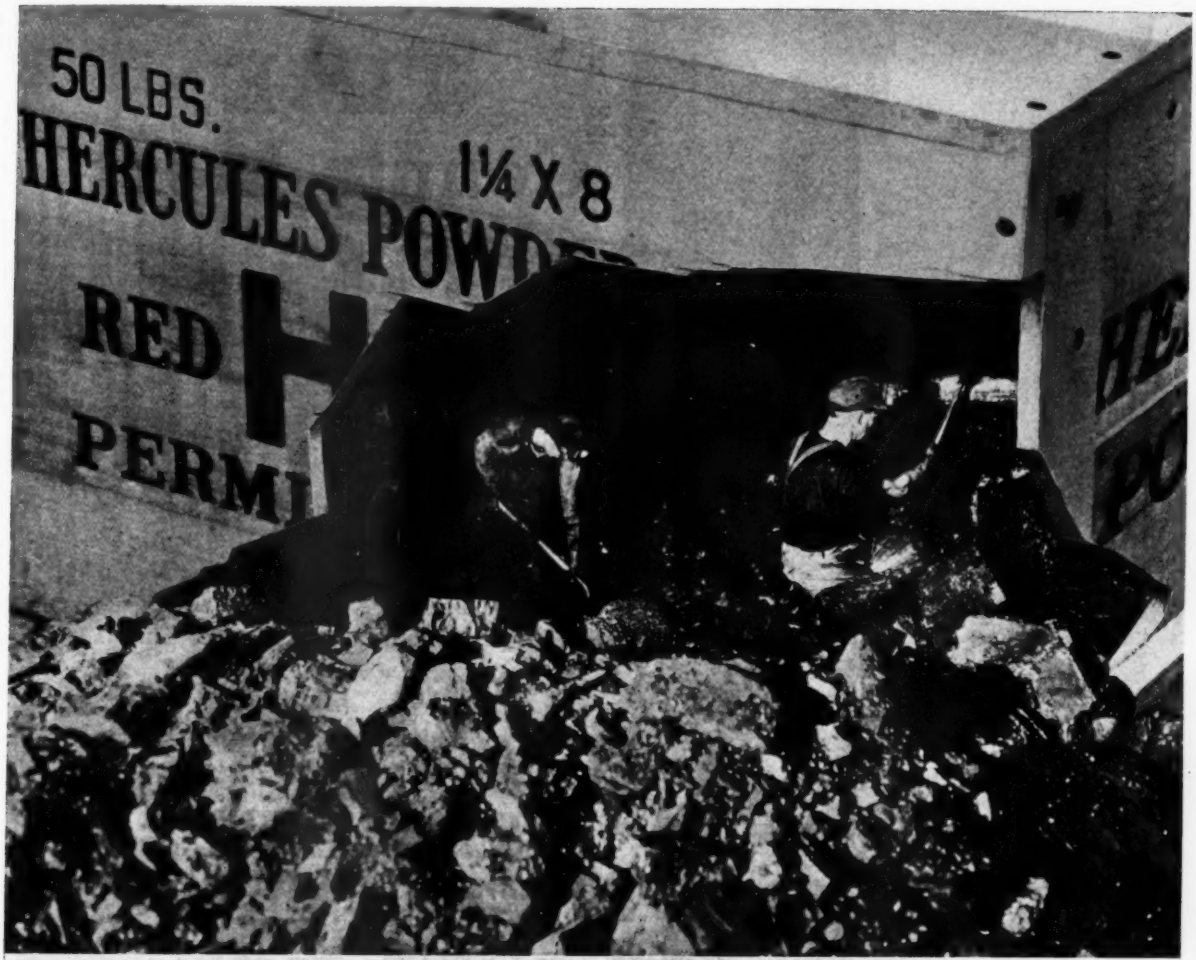

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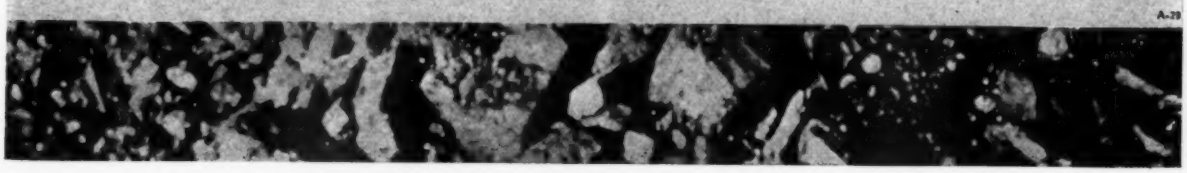

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Time is the most important factor in excavating. Dragline users throughout the world depend on the Bucyrus-Monighan Walker to lessen the working hours required. The Walker moves in straight lines. It can zig-zag or move laterally to the line of work. There is no lost moving time; every step counts. The time saved in moving is used for digging. It takes less time to complete an excavation, which is another way of saying it earns greater profits. Bucyrus-Monighan Company, Chicago, Illinois.

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Actual reports from quarries indicate a saving of from 50% to 61% in their drilling costs and a saving of 50% in sharpening costs. Anyone doing well drilling should investigate the savings derived by the use of this new I-R Sharpener.

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Not in the Contract

A young bride walked into a drug store and approached a clerk timidly.

"That baby tonic you advertise—" she began—"does it really make babies bigger and stronger?"

"We sell lots of it," replied the druggist, "and we've never had a single complaint."

"Well, I'll take a bottle," said the bride after a moment, and went out.

In five minutes she was back. She got the druggist into a corner and whispered into his ear: "I forgot to ask about this baby tonic," she said under her breath. "Who takes it—I or my husband?"

The farmer's pink-cheeked daughter was coming up the lane. She was clad in a grimy pair of overalls from the pockets of which bulged bunches of waste and sundry wrenches and tools. In her hand was a dirty satchel of iron tools.

"Where are you going, my pretty maid?"

"I'm going a-milking sir" she said.

"But why all the tools, my pretty maid?"

"Trouble," she said, "with that dam milking machine again."

"Just think! While I was out with some of the fellows the other night, a burglar broke into our house."

"Did he get anything?"

"I'll say he did—my wife thought it was me coming home."

"Why do you wear rubber gloves when cutting hair?" asked the customer.

"For the purpose," replied the barber, "of keeping our celebrated hair restorer from causing hair to grow under my finger nails."

Preacher: "Dat's as fine a goose as I evah see, Bruddah Williams. Whar did yo' git such a fine goose?"

Mose: "Well now, pahson, when yo' preach a speshul sermon, I never axes yo' whar yo' got it. I hopes yo' will show me de same consideration."

He rounded the bend at close on forty. A sudden skid, and the car overturned. They found themselves sitting together, unhurt, alongside the completely smashed car. He put his arm lovingly about her waist, but she pulled away.

"It's all very nice," she sighed, "but wouldn't it have been easier to run out of gas?"

Clerk (showing customer golf stockings): "Wonderful value, sir. Worth double the money. Latest pattern, fast color, hole-proof, won't shrink, and it's a good yarn."

Customer: "Yes, and very well told."

Teacher: "If a number of cattle is called a herd and a number of sheep is called a flock, what would a number of camels be called?"

Little Johnny: "A carton."

1st Trackman: "Have you and your boss ever had any difference of opinion?"

2nd Trackman: "Yes, but he doesn't know it!"

The Webster's James

"Don't you think," airily suggested the new partner, "that you ought to brush up a bit on your correspondence? Use big words; they lend dignity to your letters."

"Perhaps you're right," admitted the other, calmly studying the end of his cigar, "but, while eschewing mediocrity of expression through platitudinous phraseology, it behooves one to beware of ponderosity, and to be mindful that pedantry, being indicatory of an inherent megalomania, frustrates its own aim and results merely in obnubilation."

Mrs. Henry Peck: "Let's see, what is the name of that place where so much was done towards promoting peace in the world."

Henry: "Reno, my dear."

Wife: "Did you see those men staring at that flapper as she boarded the street car?"

Husband: "What men?"

Burglar Bill: "And after yez got away from de cop, where did yez hide?"

Burglar Jake: "Oh, I just ducked into de city hall, flopped down in a chair and put me feet on a desk."

"Anybody hurt in the wreck?"

"One gentleman, I believe."

"Any bones broken?"

"I think it was his heart. He sat down by a leaking suitcase and cried."

Wife: "The couple next door seem to be very devoted—he kisses her every time they meet. Why don't you do that?"

Husband: "I don't know her well enough yet."

Rastus—"Ah's sure advanced in de pas' couple ob years."

Mose—"How's dat?"

Rastus—"Well, two years ago Ah was called a lazy loafer, and now Ah's listed as an unfortunate victim ob de unemployment sitcheeyashun."

An Office Manager received a letter from his home office which read as follows: "Effective May 15, 1932, please lay off the young ladies in the Accounting Department." And he is still trying to figure out just what was meant.

"And how is your husband getting on with his reducing exercises?"

"You'd be surprised—that battleship he had tattooed on his chest is now only a rowboat."

"Feed a cold and starve a fever," say the doctors. What we would like to know is why every girl we take out has a cold instead of a fever.

Vaudeville Manager: "Why don't you go on with your animal act?"

Lady Trainer: "Pleathe, thir, I can't find my panther."

Vaudeville Manager: "Never mind your clothes. Get on with the act!"

Customer: "Wouldn't you take off something for cash?"

Salesgirl: "Sir!"

"What was the name of the last station we stopped at, mother?"

"I don't know. Be quiet. I'm working out a cross-word puzzle."

"It's a pity you don't know the name, mother, because Little Oscar got off the train there."

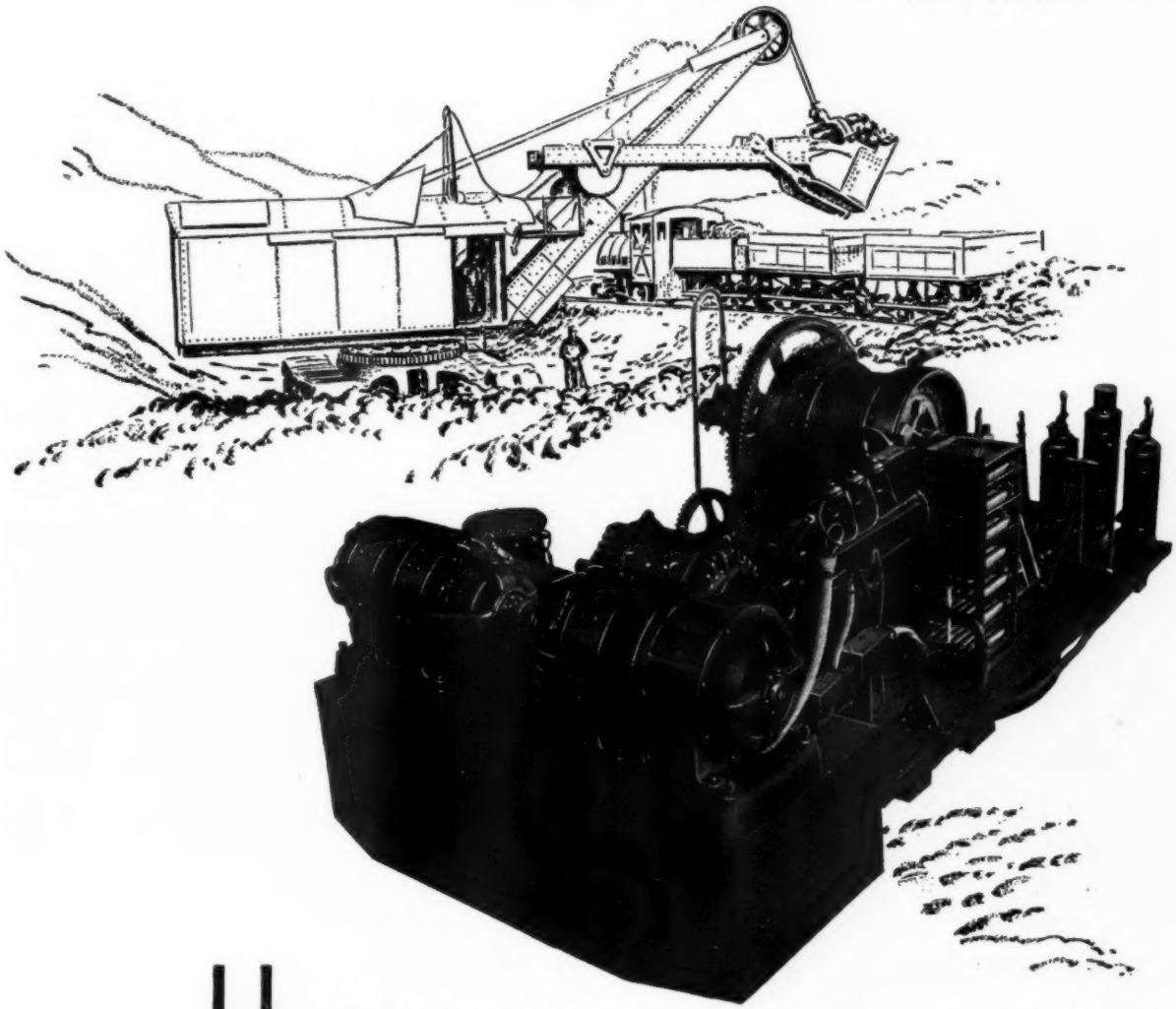
An Excavating Contractor's car struck the rear of a car driven by a woman.

"Didn't you see me stick out my hand?" the woman asked.

"No, I didn't Miss," he replied.

"Well, if it'd been my leg, you'd have seen it," she replied, and drove away.

Why most electric shovels are G-E equipped



UNFAILING dependability, smoothness, Ward Leonard control, dogged strength, simplicity, economy of operation — all characterize G-E drives for shovels — all are reasons why most electric shovels are equipped with General Electric motors and control. • Whether you are using a 1½- or a 16-yard shovel, you'll always find an added advantage in reliability and power in G-E electric shovel equipments. Specify this modern equipment for your next shovel — you'll find it a mighty profitable investment. Ask your nearest G-E office or the General Electric Company, Schenectady, N. Y., for complete information.

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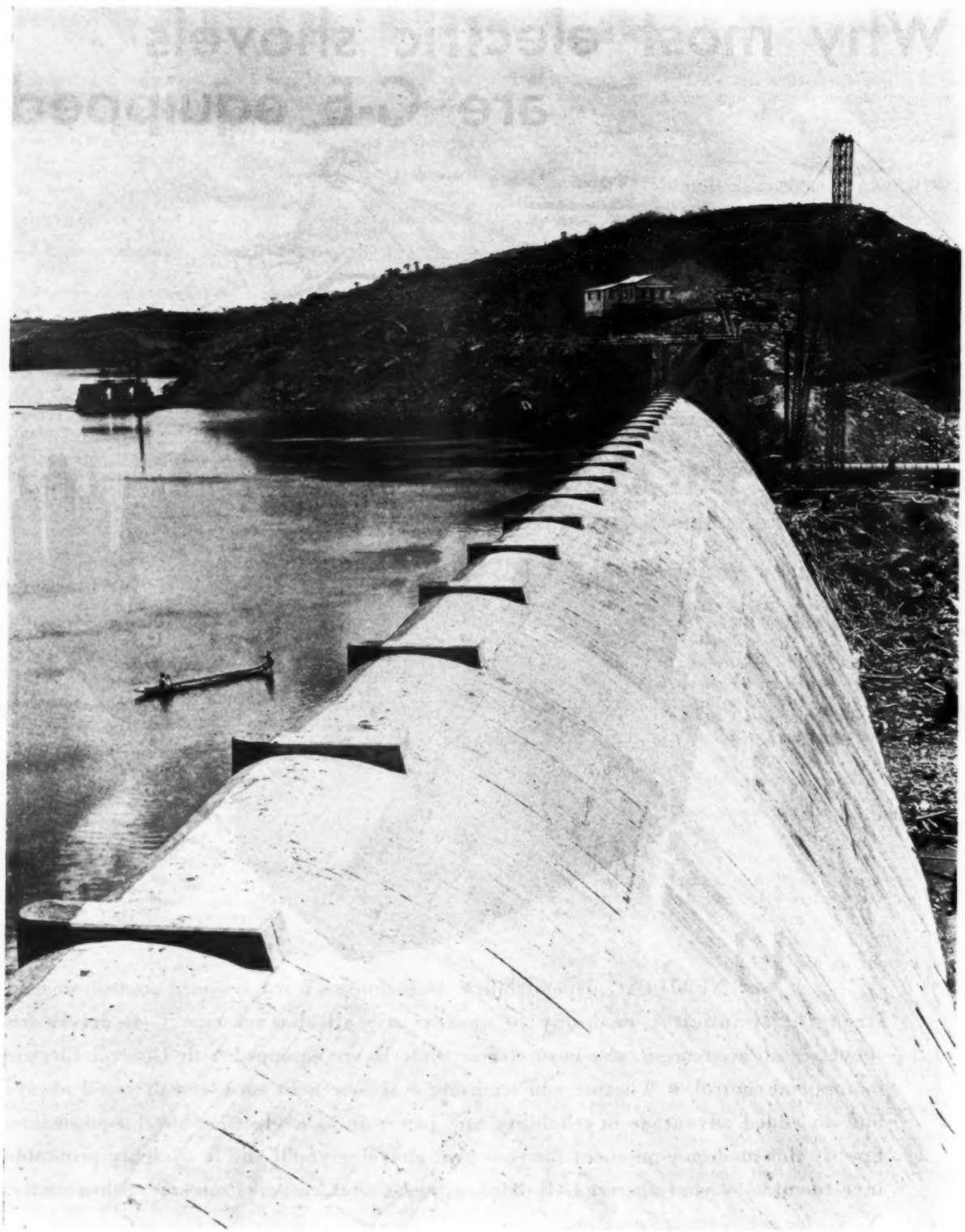

Brazil's New Multiple-Arch Type Dam

Looking across the completed Jerry O'Connell Dam from the south abutment. The basin is most convenient for the native canoeists.

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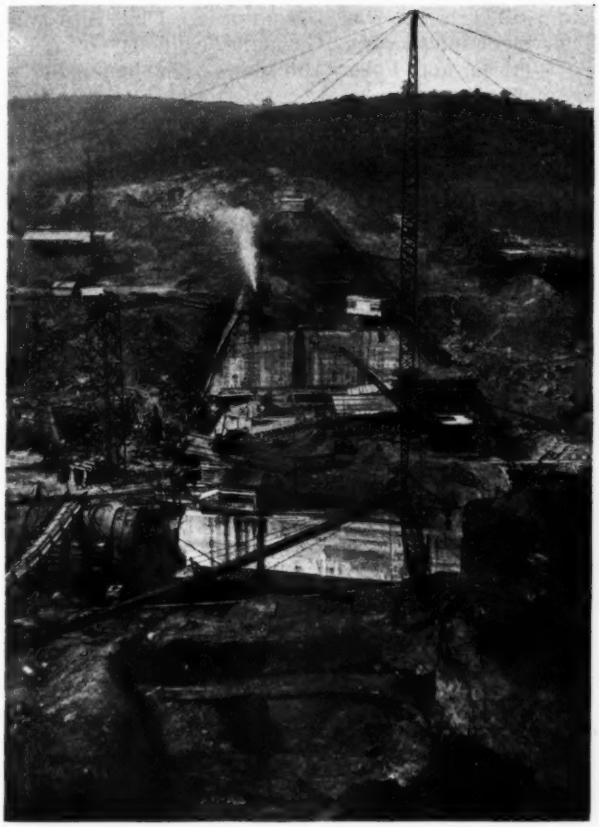


Looking across the works from the high bank on the north.

CONSTRUCTING the Jerry O'Connell Dam in Brazil

Excavating under difficulties vividly described by one of the men who helped put through this difficult project for Empresas Electricas Brasileras, South America

by RALPH A. BENNITT, C. E.

ANY dam (n) builder knows that once the foundations are in that "the job is licked". And in building the Jerry O'Connell Dam across the Rio Paraguassu in the state of Bahia, Brazil, this feature of the work was found to be no exception. The work was started in 1928 and completed in March, 1931. The dam, as completed, is hollow, of the multiple arch type, and measures 125 feet from the river foundations to the top of the spillway, by 1300 feet long.

It was constructed for the purpose of increasing the head and impounding additional water for the existing low-head hydro-electric development which furnishes power and light to the city of Sao Salvador (Bahia), and to other outlying sections in this famous tobacco district. The locality is about twelve degrees south latitude; is about fifty miles up the Paraguassu river, an estuary navigable for about forty miles.

In a Country with Seven Months Rainy Season

Transportation, labor, climate, water control, provide the greatest obstacles in constructing a dam in the tropics. On this job the management had warning of floods back in the interior from heavy rainfall, but local precipitation with a quick run-off gave considerable trouble. Partial control of the river was available because the new dam was built about a quarter mile below the old one, and a diversion canal, constructed alongside the existing penstock took care of normal dry season flow. The combined capacity of the canal and penstock was about two thousand second feet. November, December, and January, May, June, July and August are the rainy months in the district, at which time the Paraguassu has a flow of from twenty to sixty thousand second feet. An abnormal flood, during the construction period, the greatest in fifteen years, carried 120,000 second feet.

The existing power house has four Francis type turbines with a combined capacity of 4,500 KW. at the former head. The new or increased head, brought the power up to double that, and with the enlarged storage the peaking capacity can be feasibly increased to 18,000 KW. The dam

was named after Jerry O'Connell, the engineer who sponsored the project, and who later died while the work was in progress.

The work was carried on with two full shifts of ten hours each, less fifteen minutes off for "coffee". A maximum of 2,500 men were employed on the two shifts over a period of nearly two years. All of the common and a part of the skilled labor was Brazilian. The mechanics were Germans, Portuguese, and Poles; the management, American.

Foundation excavation from 15 to 35 feet

The type of dam selected in order to reduce to a minimum the materials brought in from the outside, made the problem of excavating one of digging isolated trenches. The buttresses were thirty-six feet on centers and the excavations for these and for the toe-wall were carried down a minimum of four feet into sound rock. The cut-off wall on the upstream side was excavated to a minimum depth of fourteen feet. With the overburden of soil, the seamy rock, and sound rock shattered, it was seldom that the required depth was reached in less than fifteen feet; in some cases thirty-five feet.

Tough digging here on this excavation for brick wall foundation. Material dug by hand and loaded to skips.

When the burden of soil and boulders was removed the drilling was started. The drills were Ingersoll-Rand, working, as much as possible, under a pressure of eighty pounds minimum. A battery of nine electrically driven Ingersoll-Rand air compressors furnished air to a maximum of thirty drills on the dam site and forty in the quarry. The rock was igneous formation, exceedingly hard and tough, and became harder the deeper the penetration.

Drill bits were sharpened frequently by a battery of five drill sharpeners. Starting bits were 1½", and the followers scaled down to ¾" by eighths. Three to four lines of holes, thirty to thirty-six inches on centers, were drilled for the trenches. Holes were spaced two to three feet, staggered, and drilled to a depth of three to five feet, depending upon conditions. From three to six sticks of 60% duPont dynamite, ⅞"x4", were used in each hole. Near "grade" the amount of explosive was decreased to avoid shattering the sound rock. The dynamite was fired electrically after testing a hook-up with a galvanometer. The wiring was in series. The blasting was, for the greater part, done at noon to safeguard the work and the employees.

Death Makes Holiday

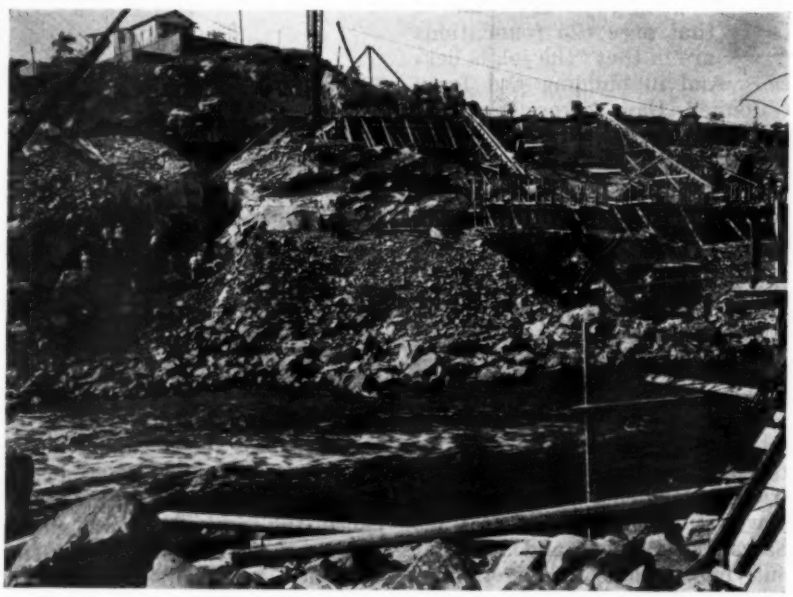
Every effort was made to avoid accidents from blasting, falling rocks, slides, and the like, for two good reasons. To wit; the humanitarian one; and second the custom of the Brazilians of taking off the entire day with full pay when a man is killed on the job. And, aside from minor injuries, there were remarkably few serious accidents for a work of this character and magnitude.

For the excavation work on the south side of the river, one steam and two electric Wiley Whirleys were used. These also served to hoist materials, pour concrete, and lift the heavy arch forms. At the extreme south end a guy derrick was set up.

The greater part of the excavated material was removed in skip boxes. The skips were ruggedly built of heavy steel and were about four feet square by sixteen inches deep, one end of which was open. They were hoisted by a three-chain bridle hooked to two eyes at the rear and a ring at the open end. When a skip was filled, a native signalled the operator who hoisted and swung it around to the spoil bank, where a laborer unhooked the forward chain. Hoisting of course, dumped the skip.

Skips Take a Lot of Watching

A word might be said as to the labor lost by loads moving through the air high above the heads of



Excavating for the arch foundations with Bucyrus-Erie shovel. One can readily appreciate the difficulty of getting equipment out in face of a quick rising tropical flood.

men working below. There is not only the natural tendency to watch until one is out of danger from falling rocks, but a fascination in seeing a load swing grandly and easily through the air (and fog). Added to which is that peculiar quirk in humans which causes them to wonder if something is going to happen. How much of this time lost is chargeable to method and how much to rest period is difficult to determine.

At times in the river section, it was possible to use a Bucyrus-Erie, ¾-yard, Diesel shovel, which loaded into one-yard Chevrolet trucks. A gasoline driven American crane with a forty-foot boom was also used in the gravel and boulder strewn river bed, supplementing the work of the Whirleys which reached this part of the work at a later date. It was tricky business, nevertheless, as the Paraguassu river becomes a roaring flood in a few minutes. As soon as a flash-board in the old dam tripped, it was only a matter of minutes until the site below was covered by a foaming raging flood. Twice, machines were caught without warning.

Here are two views at high water. The upper is taken across the dam site and gives some idea of the roaring, tearing floods that came down to delay and endanger the construction crews. In the lower view we see trenches flooded by the high water.

This Flood Came in the Night

I remember well an interesting incident connected with the Bucyrus-Erie. We had been working all night, and were trying desperately to prepare foundations in the river section, so instead of sending the men and the shovel operator home at the usual time of 3:30 we kept whanging away, so that the day shift could pick right up at six. The Bucyrus-Erie was working in some tough material — great boulders, jagged chunks of rock, and gravel.

Temporary suspension bridges provided access across the channel.

She had nosed out a road in the river bed, slightly inclined as we were trying to get down to rock, and then clean up on the return. (And, by-the-way, she loaded the trucks faster than we could get them to her in spite of the tough digging.) Ordinarily, we walked the machine up the bank at 3:30 where she would be high and dry in case of a flood but this night, of course, the flood came down. And without warning. I had just left the river for a few minutes to see about some other work at a few minutes before six when—Pow! The Brazilian running the Chevrolet truck beat it when he saw the first water trickling down, leaving his truck smack in the way. The shovel operator ran up and told me, and I grabbed the night man in charge of the machines.

The water had covered the treads by the time the night mechanic could climb into the cab. He started the Atlas-Imperial engine with a bang while some one tried to start the truck to get it out of the way. The truck would not start and he picked it up and swung it to the side. But the delay was fatal. The running water had loosened up and washed away the narrow road and in a few minutes was a foot deep in the cab. The operator jumped and swam for shore a few feet away.

The Bucyrus-Erie sat there in the water for a good week but when the water subsided she kicked right off and began percolating again as good as ever. We used

her for heaping up our stock pile of stone when it got low, and it did great work loading trucks in the quarry. If ever there was any brutal digging that work in the quarry was it. Great pieces of rock, hard and sharp, and she stayed with it day and night, month in and month out. She's a great machine.

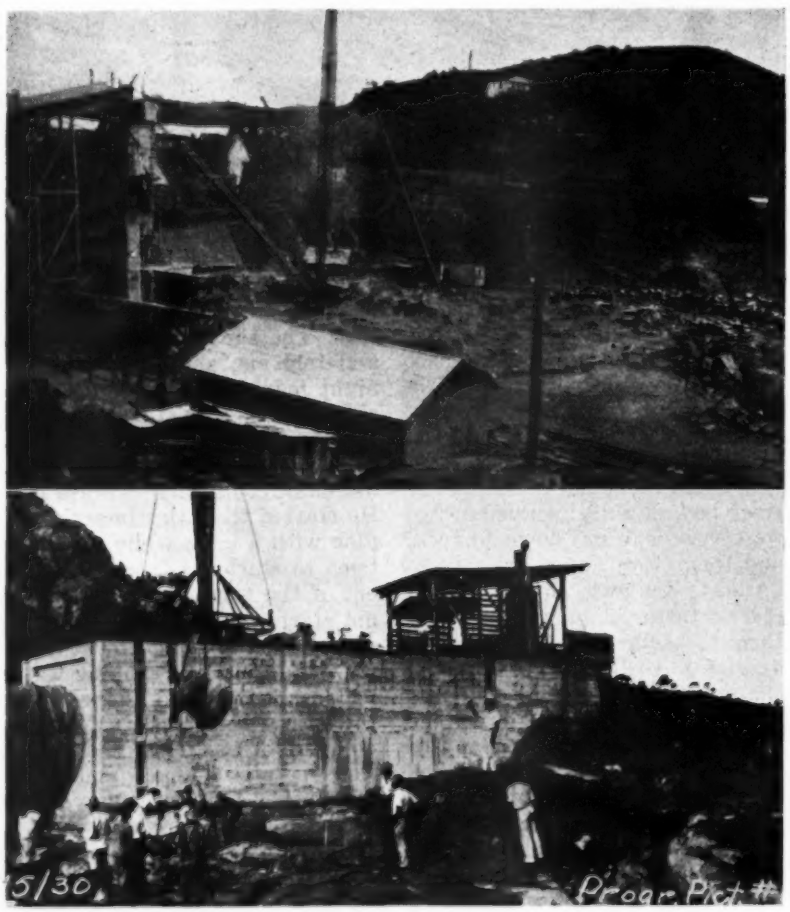
Water leaking through the flash-boards and seeping through the seamy rock was handled by gasoline "mud-hogs", two four-inch and one six-inch electrically driven centrifugal pumps, steam and water ejectors, as the occasion warranted. And the pumps, handled by sleepy, more-or-less skilled mechanics, were a constant source of trouble and worry.

Derricks Work on North Side

The work on the north side of the river involved a different method of attack. A 110-foot boom steel guy derrick with a three-drum steam hoist did noble work within its radius. It loaded into four-yard wooden dump cars operating on a 24" guage track. Three to four cars were hauled by an ancient wood-burning "teapot" built by the American Locomotive Works some fifteen years earlier. The cars were dumped on a spoil bank five hundred yards downstream from the dam.

A wood guy derrick, steam driven, was set up near the upstream side to handle the excavation for the cut-off wall. This was moved toward the river as a section was completed. Its scope of operation was increased by rolling rocks to it; the material more distant was heaved or rolled up the side of the trench by main strength and awkwardness. The steep rock face carried the material to or near the river where it was handled later by the Bucyrus-Erie and the American. A three foot overburden of soil was disposed of by shoveling it into a wooden sluiceway and washing it down to the river, where it was carried away.

The steel derrick, as shown in the photograph, was mounted on a solid block of concrete poured around the existing penstock, beside the diversion canal mentioned above. Beyond this was a steep hillside with a burden of earth, clay and gravel, varying in depth from two feet to forty. The steep slope and the swift water in the canal was ideal for sluicing operations. Water shot through a one-inch nozzle on a three-inch fire hose under sixty pounds pressure was quite successful in bringing down a large amount of material at low cost. The bed of the canal was paved, anticipating a future penstock, and the swift current washed away dirt and fair sized boulders.



Above: General construction view. Below: Excavation at Intake Section.

Special Care Necessary in Blasting

This work was too close for comfort to the operating penstock, a pipe of ⅜" steel, 12½ feet in diameter, and great care was taken to avoid damaging it when blasting or hoisting the rock. Had a hole been torn in this shell it would have resulted, for a day or more, in the loss of all power on the job, and a portion of the power furnished to Sao Salvador (Bahia), a city of some 300,000 inhabitants. Accordingly, all drill holes were loaded with black powder.

The extreme northern end was of solid gravity section and it was particularly necessary to obtain a foundation below any water bearing seam. A stiff leg derrick was constructed on the steep hillside to handle the rock excavation with the usual skips, wasting downstream.

Not only must the excavation be carried well into sound rock, but scrupulous care was exercised that the trench bottoms and sides be thoroughly clean before pouring concrete. When grade was reached, the rock was washed down with a hose and the rough uneven floor and sides, broomed, and scraped with shovels and small hand scrapers, removing all traces of dirt and loose or unsound rock. Then came concrete; that is, when a flood, cloudburst, or slide, did not come first.

A flick of the operator's thumb and three yards and more of stone go crashing down into the sturdy Easton Phoenix body. Three years of hard service behind this sturdy, modern shovel but maintenance continues to run below the expected cost.

MODERN METHODS Used in Old DOLOMITE QUARRY

Clinton Point Quarry of New York Trap Rock Corporation is Old Operation with Up-to-Date Equipment

by **SPENCER A. JONES**

IN AN earlier issue of the Excavating Engineer we visited the Haverstraw quarry of the New York Trap Rock Corporation.* Now we drive forty miles north from Haverstraw, along the west bank of the Hudson River; cross to the east bank, over the Mid-Hudson bridge, to Poughkeepsie; and drive seven or eight miles south along the east bank until we come to the Clinton Point quarry of the New York Trap Rock Corporation.

Presenting our credentials to Ray Coy, the superintendent, we are given the run of the place with a friendly welcome. We learn that this quarry, originally opened in 1879, has passed through many different ownerships until, in 1919, it was taken over by the present owners. Leaving the office with our trusty camera, we note that the most of the crushing plant, storage silos and loading facilities are just a few feet above water level, between the New York Central railroad tracks and the river.

A high, wire fence runs along both sides of the tracks, and east of this double barrier is the quarry floor and the grayish-white quarry face. A private highway bridge crosses the tracks a thousand feet or so south, but just above our heads is a belt conveyor housing which also crosses the tracks and slopes down to the primary crusher house on the quarry floor. We enter a building containing a couple of Symons

* December, 1932, Page 561.

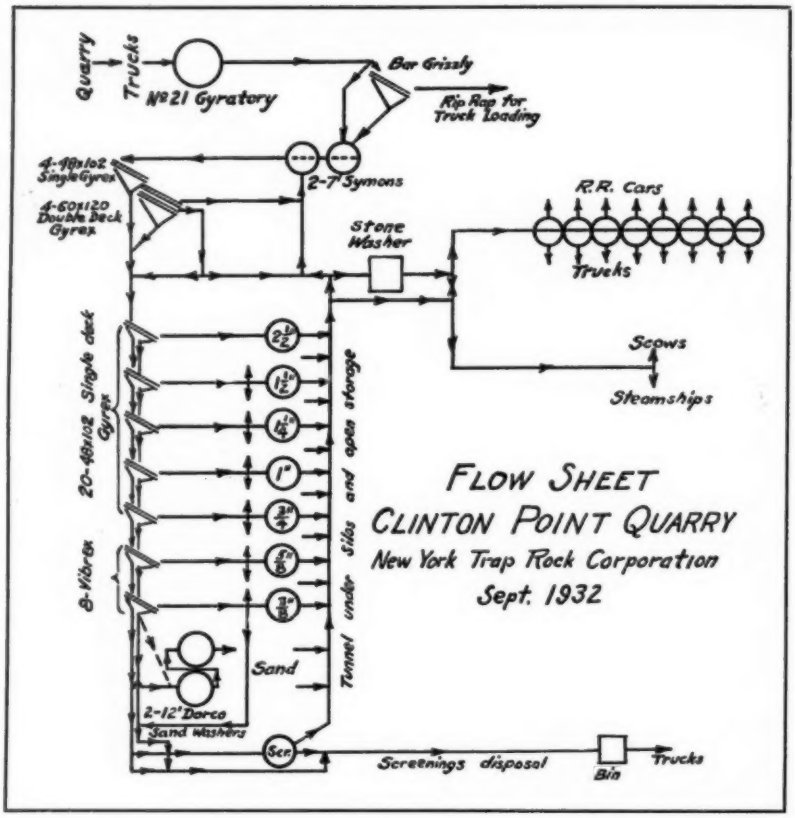
Crushers and climb to its top where the conveyor coming from the primary crusher discharges into the bins over the Symons crushers. Then we walk down the sloping conveyor housing beside the smooth-running, evenly-loaded belt. Just as we are over the railroad tracks, the Empire State Express roars northward beneath us.

Quarry Floor Like a Boulevard

The conveyor belt gets its load at a boot many feet below the quarry floor, under the primary crusher, but we leave the housing at the quarry floor level and walk over toward the quarry face. The quarry floor appears to be only two or three feet higher than the ground at the mill on the west side of the tracks. Like the floor at the Haverstraw quarry, here is another well-drained boulevard, 2,000 feet long and 1,000 feet wide, made of water-bound dolomite screenings and leveled off with a road scraper.

Ray Coy has told us that the rock at Clinton Point is a sedimentary dolomite, or calcium-magnesium carbonate. Maybe this quarry was a coral reef millions of years ago. The quarry face is east of the quarry floor and, unlike Haverstraw, is visible from the river. It ranges in height from 60 to 130 feet, and is about 2,000 feet long. The upper portion of the cliff is composed of comparatively loose fractured rock; the central and lower portions are of more massive structure, but vertical and horizontal fissures and crevices abound.

Looking up at the storage silos in the Clinton Point plant of the New York Trap Rock Corporation. The camera was about ten feet from the ground when the picture was snapped. The two circular structures in the foreground are parts of a retaining wall to separate open storage piles. Each silo has one of these retaining walls on each side of it. The circular form gives tremendous strength laterally with great economy in the amount of concrete needed for construction.



Obsolete Railroad Shovels Replaced in 1929

John Flynn, the quarry foreman, comes up to shake hands and tells us that until the latter part of 1929 the rock was dug by two Bucyrus-Erie 50-B's, one Bucyrus-Erie 110-C railroad shovel, one Class 45 Atlantic railroad shovel and one Bucyrus-Erie 103-C railroad shovel. Eight 25-ton saddle-tank dinkey locomotives hauled about fifty 8-yard cars back and forth from the shovels to the primary crusher.

In 1929 construction was started on an entirely new plant and method of operation, under the direction of Sterling Tomkins, Vice President of the New York Trap Rock Corporation, assisted by E. Lee Heidenreich, Chief Engineer and General Superintendent. The Burrell Engineering and Construction Company prepared the general plans and received the general construction contract, subletting structural steel fabrication and erection to the Lackawanna Steel Construction Corporation. All excavating and the installation of machinery was done by the owner. A schematic flow sheet of the operations is shown herewith, and a brief description of the flow through the mill will be given later.

Getting back to the quarry, we note that there appears to be not more than about 3% overburden. The average depth is less than 5 feet, but occasional pockets contain as much as 20 feet of earth. A Northwest No. 104 dragline is busy on top of the cliff, scraping away with a 1¼-yard type-S Page bucket. The overburden is being loaded into a couple of 7½-ton AB Mack end-dump trucks and hauled away to a dump. Some laborers are digging away with

hand shovels, cleaning out one of the pockets of earth that the dragline bucket could not reach.

8-inch Holes Drilled at Rate of 2 Feet Per Hour

Seven 6-inch and one 8-inch electrically driven Sanderson Cyclone well drills (the latter with caterpillar type mounting) are strung out along the top of the quarry face, pounding out blast holes. A 3-ton Dodge truck stops at one of the 6-inch well drills and

Piling them up—320 truck loads in an 8-hour day is no trouble at all says Operator Merritt—and that's 1900 yards.

picks up what looks to us like an 8-inch bit to take it down to the quarry floor for sharpening. Questioning Antonio Daniels, foreman blacksmith, we find that the 6-inch drills have all been converted for use as 8-inch drills.

The well drills make an average of 2 feet of hole per hour, and bits are sharpened every 2 to 4 hours in the blacksmith shop on the quarry floor. We see drills for Jackhamers, but no drifter drills, and learn that no toe holes are drilled at Clinton Point, but that nine Ingersoll-Rand R-12 Jackhamers are used for blocking.

Air for Jackhamer operation and a No. 50 Ingersoll-Rand drill sharpener for sharpening is furnished by an Ingersoll-Rand 14-inch x 22-inch x 16-inch Class PRE-2 electrically operated compressor, in charge of John Laffin.

Angelo DiMartino, blasting foreman, gives us the dope on blasting. Well drill holes are used exclusively; they are 8 inches, or a trifle more, in diameter; spaced 20 feet apart and 18 feet back from the quarry face; and extend 3 to 5 feet below the quarry floor level. Frequent blasts are made, as only five holes are shot at one time.

58 Pounds of Explosives Break 100 Yards of Rock

Blast hole loading is based on bringing down 100 cubic yards of solid rock for each 58 lbs. of gelatin. All gelatin is 60%, Hercules, Atlas or duPont. Three 7"x24" cartridges rest on the bottom of each hole and the end of a Cordeau-Bickford safety fuse is poked into the third cartridge from the bottom. Above these three bottom cartridges come alternate fillings of rock-sand-stemming and gelatin. Adjacent holes are so loaded that the intermediate charge in one hole comes opposite the intermediate stemming in the other. Above the highest charge, the hole is stemmed with rock-sand to the surface of the ground.

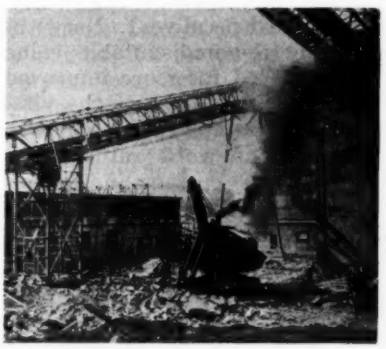
Five feet of Cordeau protrudes from the top of each loaded hole. Each of the lengths of Cordeau is hooked to a Cordeau header which has a No. 6 exploder at each end. The two exploders are wired in series and are fired with a 50-hole battery.

The end break is considerable, so that the new end blast hole of the next firing row is usually about 40 feet away from the nearest end hole of the blast just fired. Rock brought down by the blasts is quite well broken and there is not an excessive amount of blocking to be done, although, due to the character of the formation, occasional large unbroken pieces are dislodged.

George Fitterer, one of the electricians at the Clinton Point Plant, posing beside the Ingersoll-Rand compressor.

Four Bucyrus-Eries Load to Truck

Four Bucyrus-Erie shovels load the broken rock into trucks for hauling to the primary crusher. The nearest shovel is an electri-



The 50-B Bucyrus-Erie steam shovels did noble work for the owners in excavating for the new plant at Clinton Point in 1929 and 1930. This photo shows typical conveyor housing and supporting steel work before covering with corrugated metal siding and roofing.

cally operated 100-B with a 3-yard dipper. A 2,200-volt 175-h. p. General Electric motor-generator set gives it ample power, and Frank Merritt, the operator, says that he has no trouble putting out 320 truckloads in an 8-hour day—that's over 1,900 yards. The 100-B was bought early in 1929, and has not only required no major repairs, but also has required fewer repairs, due to normal wear and tear, than was expected considering the service given.

Three 50-B Bucyrus-Erie steam shovels with 1⅞-yard dippers are snorting and puffing at various points along the base of the cliff. One of them stops to rest for a moment as a 1-ton Dodge truck brings up a load of soft coal. While resting, the 50-B takes a drink of water, supplied by a De Laval 6-inch centrifugal pump driven by a 40-horsepower G. E. motor.

These 50-B's were bought new, one in 1925, two in 1927. They have given excellent and dependable service and upkeep has been consistently low. 220 truckloads —1,320 yards—is not considered too much for each 50-B to handle in an 8-hour day.

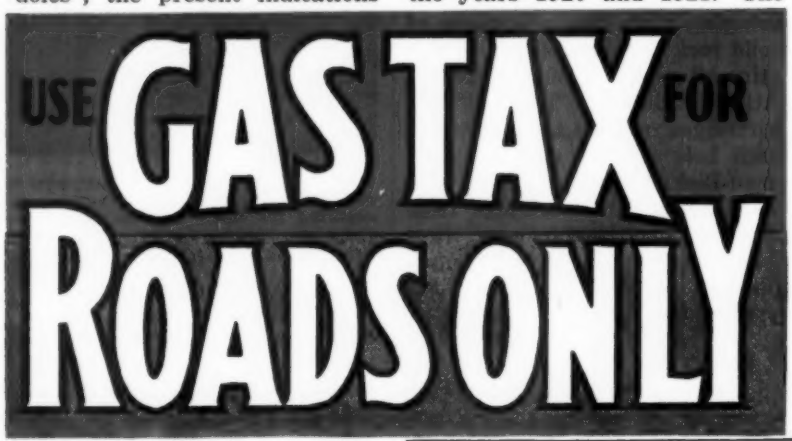
The trucks which haul the rock from the shovels to the primary crusher—a distance of 1,000 to 1,500 feet—are 7½-ton AB Macks

(Continued on page 94)

1932—Highway Construction—1933

Additional data supplementing the comprehensive summary published last month.

AS WE GO TO PRESS the Congress of the United States is still considering appropriations for Federal Aid for the next fiscal year. Notwithstanding the undisputable value and the need for more improved roads . . . . in spite of the vital need for unemployment relief in the form of work rather than "doles", the present indications



**Above: The gummed face of this windshield sticker (reproduced ¼ actual size) has white letters outlined against a background of red and blue. Right: This appeal appears on the reverse side.*

are that there is grave danger of the Federal Aid being seriously cut. If this occurs it is probable that many State Legislatures would follow the example of Congress by slicing from the Highway appropriations an undue percentage of the savings demanded by the tax payers.

Federal Aid is but a small percentage of the Nation's budget for good roads. The first appropriations for Federal Aid as now constituted were made in 1916 after a joint committee of the Senate and House of Representatives had studied the situation for four years. A "five year plan" was made based on a total budget of $75,000,000 and with $5,000,000 available in 1917, the first year. The annual expenditures under this schedule were to climb to $25,000,000 in 1921. In 1919 an additional $50,000,000 was added to make available $75,000,000 for the years 1920 and 1921. The same amount was appropriated for 1922 and this general rate was maintained with some slight increases through 1931. An additional $50,000,000 was added in 1931 as an unemployment relief measure and in 1932 and 1933 this emergency increase totaled $125,000,000 each year. At present these sums are running about 8 percent of the total annual highway expenditure in the United States, so any decreases by Congress in Federal Aid will not cripple the Highway Industry. It will, however, react on appropriations of State, County and Local bodies so that whatever reduction is made in the Federal funds will be multiplied many times in the total reduction in roadwork.

Fortunately in some state laws specify the use of gas tax and motor vehicle license funds so that a fair proportion of these taxes goes back to the tax payer in better roads. However, the legislature that gives may also be the legislature that taketh away . . . already some of these fair prearrangements for use of such revenues have been abrogated by hard pressed legislatures . . . in other states the raiding of the road taxes has so far been successfully resisted. According to the *Portland Cement Association* $142,000,000 was diverted in 1932 from Highway funds to other than road purposes.

While stringent economy in Government expenditure is vitally necessary at this time, it will be unfortunate if political expediency results in impairing the progress which has been made within recent years toward providing all parts of our country with the advantages and economy of suitably improved roads. State Highway work during the 1933 construction season was responsible for the employment directly and indirectly of approximately a million men who earned a living wage for themselves and their families and at the same time repaid the public for their expenditure by giving them more comfortable, more convenient and more economical transportation. With the bargain prices which the contractor is offering to the Highway Department for road construction today, it is to be hoped

USE MOTOR TAXES FOR ROADS ONLY!

Motor taxes were created to pay for the roads and streets on which you drive your car—and for that purpose ONLY. Your mileage costs are LESS when you drive on improved highways. THIS PAYS YOUR MOTOR TAX as long as the road money is spent for improving the highways, the main city streets and country roads.

Now it is proposed to divert this money from job-giving road work to other purposes—to general public expenses which EVERYBODY should help to pay.

Motor taxes become CLASS taxes when they are used for other than the improvement of the motorists roadway. Misuse of highway funds will add thousands to the unemployed ranks. YOU will get less benefit for your motor taxes and so will the working man.

Let your Public Officials know you want ALL of the GAS TAX and LICENSE FEE MONEY spent for improved highways—AND NOTHING ELSE!

BOTH THE WORKING MAN AND THE MOTORIST WILL BENEFIT

***NOTE: Organizations interested in distributing these stickers which are sponsored by the Portland Cement Association, Chicago Motor Club, Illinois Construction Council, and other organizations, can obtain them from the Ray Press, 633 Plymouth Court, Chicago, at prices ranging from $3.50 per thousand in lots of 10 to 50 thousand to $2.50 per thousand in lots of 100 to 150 thousand. (We understand the use of windshield stickers in Pennsylvania is illegal.)**

that the fullest possible use can be made of the economical construction offered.

An organized fight is being carried on in many communities to prevent diversion of highway revenues to other than highway purposes.

Red, white and blue windshield stickers, similar to the accompanying illustration carry the timely message *"Use Gas Tax for Roads Only"* and are beginning to be seen in large numbers on the highways of various states.* Imprints on letterheads carry the same slogan.

Many communities through their Chambers of Commerce, motor clubs or other organizations have taken steps to protect these road taxes for road use. Letters have been written to legislators, petitions signed by business men and voters have been presented, public meetings have been called and information regarding the situation disseminated through the newspapers and the trade papers of various industries vitally interested. It will be several months before the final results so far as the 1933 highway appropriations can be even estimated. Undoubtedly the fight will have to be continuous if any permanent success is to be obtained.

The January issue of *Excavating Engineer* carried a very complete digest of available information on 1932 road building with a forecast of such plans as were available for 1933. Since that issue was published additional information has been secured from a number of states and this is summarized below. As further information is received it will be published in later issues.

*The Portland Cement Association of 33 West Grand Avenue, Chicago have available for distribution a leaflet for the use of those fighting to protect the highway dollar summing up statistics and arguments on "Use of Motor Taxes for Roads Only". Sample copies may be obtained on request. Large quantities can be supplied with the imprint of the organization sponsoring distribution for $2.00 per thousand.

California

Griffith Company of Los Angeles uses these two Bucyrus-Erie 43-B Diesels powered with Atlas Imperial Diesel engines in grading the Baranca Street cut-off between Pomona and Covina. 400,000 cubic yards of excavation are required and some of the cuts are about 90 feet deep through hard shale and rock and adobe soil. 40 feet of the 100 foot right-of-way will be paved with 9x7x9-inch concrete when the seven miles of grading is completed. This job is being carried through under the personal supervision of John Holmstrom of the Griffith Company.

The following shows work contemplated and programmed by the California Division of Highways at Sacramento for the last half year of the present biennium which ends July 1, 1933 and also for the 85th and 86th fiscal years or the two year period starting July 1, 1933.

The work scheduled for the period from January 1st to July 1st, 1933 totals $5,645,064 and consists of the projects listed in the tabulation in the column at the right.

County	Grading, Surfacing and Paving	Cost
Contra Costa	0.4 mi. paving through Crockett (Cooperative)	$ 35,000
Imperial	0.4 mi. paving Brawley	28,600
Inyo	6.4 mi. grading Bishop to Round Valley	70,000
Inyo	6 mi. surfacing Keough's Hot Spring to 1 mi. south of Bishop	120,000
Kern	3.7 mi. paving Oak Glenn to Grapevine	640,000
Kern	3.5 mi. paving Union Ave. to Tank Farm	340,000
Lassen	1.9 mi. surfacing east of Susanville	15,000
Los Angeles	3.9 mi. paving Gorman to northerly boundary	210,000
Los Angeles	4.1 mi. paving Las Flores Canyon to Santa Inez Canyon	516,000
Los Angeles	1.2 mi. paving Mint Canyon Line Change	60,000
Los Angeles	1.4 mi. paving Redondo Beach	68,800
Merced	0.2 mi. paving Merced River Bridge approaches	75,000
Monterey	5. mi. paving 1 mi. to 6 mi. So. San Ardo	230,000
Orange	5.6 mi. paving Irvine to Tustin	177,000
Placer	12 mi. surfacing Gold Run to Airport	371,374
Riverside	10.9 mi. paving Edom to Indio	314,000
Sacramento	1.5 mi. paving Cosumnes River to 1.5 mi. north McConnell	26,600
San Bernardino	10.2 mi. paving Colton to Ontario	335,000
Santa Barbara	0.9 mi. paving Ellwood approaches	80,000
San Diego	4.4 mi. grading Barnett to Balboa	135,000
San Mateo	3.1 mi. paving San Francisco to South San Francisco	204,700
Santa Clara & Santa Cruz	4 mi. grading Saratoga Gap to Black Road	300,000
Shasta	0.6 mi. surfacing Redding westerly	10,000
Siskiyou	3.9 mi. surfacing Dorris to northerly boundary	135,700
Siskiyou	Grading-bridge Weitechpec to Happy Camp	25,490
Stanislaus	0.2 mi. paving Stanislaus River Bridge approaches	11,300
Tulare	4.2 mi. paving Plaza Garage to Goshen	272,000

Bridge Construction

Kern	Bridge across Beardsley Canal	$ 23,000
Los Angeles	Bridge across San Gabriel River	160,000
Sacramento	Bridge at McConnell	66,500
Monterey	Bridge at Soledad Crossing	60,000
San Bernardino	Bridge across Mojave River near Barstow	101,000
San Bernardino	Bridge at west entrance of San Bernardino	150,000
Santa Barbara	Bridge at Ellwood Crossing	60,000
Santa Clara	Bridge at Madrone crossing (State's share)	74,000
Stanislaus	Bridge across Stanislaus River	94,000
Tulare	Bridge near Plaza Garage	50,000

Following is the complete California Division of Highways program for the biennium starting July 1, 1933. The schedule for the two years total $23,503,105.

County	Grading, Paving, Surfacing and Oiling	Cost
Alameda	1.3 mi. grading, paving, and bridge Oakland to 1.3 mi. south	$104,300
Alpine	6.6 mi. grading, surfacing and bridge Centerville Bridge to Markleeville	230,000
Butte	4 mi. grading Jarboe Pass to Bardees Creek	425,000
Calaveras	9.4 mi. grading, surfacing and bridges San Andreas to Angels (por.)	120,000
Colusa	8 mi. grading, paving and bridges Maxwell to northerly boundary	381,000
Cooperative City Projects	Northern Counties, grading, paving, surfacing, etc.	1,432,280
Cooperative City Projects	Southern Counties, grading, paving, surfacing, etc.	2,440,532
Del Norte	9.2 mi. grading Last Chance Slide to Flannigan's	565,000
Del Norte	4.2 mi. surfacing Oregon Mt. Summit to State Line	37,500
El Dorado	2.2 mi. grading Fred's Place to 2.2 mi. easterly	100,000
El Dorado	9. mi. surfacing Kyburz to Strawberry	115,000
Fresno	1.8 mi. grading and paving Selma to Fowler Switch Canal	85,300
Humboldt	7.5 mi. grading, surfacing and bridges Benbow to 7 mi. north of Garberville	575,800
Humboldt	2 mi. grading and surfacing Jordan Creek to So. Scotia Bridge	102,100
Humboldt	9 mi. surfacing Trinidad to Big Lagoon	80,000
Humboldt and Siskiyou	Grading, bridges Weitchpec to Happy Camp (portions)	100,000
Humboldt	Sidewalks—Redwood Creek Bridge	9,000
Imperial	Grading, paving and bridges, Arroya Salado, Tule and Campbell Washes, San Felipe Sand Dunes	80,700
Imperial	3.2 mi. grading and paving Trifolium Canal to 20-ft. pavement	80,800
Imperial	33 mi. surfaced shoulders Trifolium Canal to north boundary	93,000
Imperial	7 mi. surfaced shoulders Holtville to Highline Canal	28,000
Imperial	6.1 mi. surface shoulders Araz to Yuma	6,100
Imperial	21 mi. grading, paving and surf. shoulders E. Highline Canal to Sand Hills	590,000
Inyo	13.1 mi. grading and surfacing south limits of Bishop to Birchim Canyon	170,000
Kern	6 mi. grading and surfacing Haypress Canyon to Bear Mt. Ranch	400,000
Kern	10.5 mi. grading and surf. Maricopa to W. Boundary	250,000
Kern	1 mi. grading and paving 1 mi. to 2 mi. So. of Delano	37,000

(Continued on page 88)

FIELD NOTES

Hand Labor vs. Machinery

MUNICIPAL authorities could not make a valid award of a sewer construction contract at $12,091 for local hand labor, where another responsible bidder offered to do the job with machine labor at $9,819.90, ruled the Court of Common Pleas for Luzerne County, Pennsylvania, in the recent case of Perry v. Borough of Wyoming, 24 Pa. Munic. Law Rep. 113.

First, the court decided that, "a provision limiting the territory from which a bidder must procure labor undoubtedly tends to conflict with the [statutory] requirement that the contract be let to the lowest responsible bidder, if such provision in anywise tends to increase the cost of the work."

As to the right of the municipal authorities to discriminate against a low bid for doing work by machine labor, the court added:

"No greater benefit will be conferred upon the borough by the use of hand labor instead of machinery. The difference between the two bids amounts to approximately one-sixth of the contract price. While the provision, that contracts shall be made with the lowest financially responsible bidder, does not prevent municipal authorities, in the exercise of a sound discretion, from determining who is the lowest responsible bidder, their conclusion must rest upon a full and honest investigation of the respective bidders. * * * The statutory requirement that municipal contracts be awarded to the lowest responsible bidder is mandatory, * * * and cannot be disregarded by courts or municipal officials even though the purpose be to furnish work to the unemployed. This result may be effectuated by employing laborers to do work other than that designated in the contract, but does not justify the award of the contract to the higher bidder."

The court did not deal with the right of a Legislature to empower cities to give preferences to local labor in awarding contracts. It merely decided that under a general statute, or municipal charter provision, unqualifiedly requiring contracts to be awarded to the lowest responsible bidder, the use of machine labor cannot be discriminated against.

—A. L. H. Street, Attorney-at-Law.

Another Emergency Pants Button, and a Good One

MAN'S needs in an emergency are often the cause of much clever originality. An extreme necessity brings out the practical and serviceable substitutes for many things. Such a case is often the loss of a pants button for the suspender. Nails, chips of wood, cord and other things ad infinitum make up the list of ready devices which feebly take the place of a well sewed button on the field trousers. The above photo shows the novel use of a small can opener key. Half of the thin slotted portion of the key is forced through the cloth of the trousers, and then bent sharply upwards, being firmly pressed to the cloth on either the outside or inside. The handle of the key makes an ideal button for the fastener of the suspender. There is only a slight hole made through the cloth where the opener pierces it, but it grips and fastens better than any button. You can pick up one of these opener keys about camp, when you might be miles from a thread, needle and button.

—Frank W. Bentley, Jr.

Mike: "When ye married I suppose yer wife placed her fate in yer hands?"

Pat: "Not on yer loife! She placed 'em agin me back."

More About Turnpike Sections

IN OUR December issue we gave replies by H. S. Fairbanks of the Bureau of Public Roads and J. H. Stemmer, Idaho's Director of Highways, to an inquiry from Walter Osterloh of Hoops Construction Company for a definition of "Turnpike Section."

From *Major W. J. Ross, O.B.E.*, of the *Foundation Company*, enroute from Salonika, Greece, to British East Africa, comes a most interesting comment which follows:

"Surely your article in issue of December, 1932, does not go far enough back.

"The origin of 'turnpike' was as follows: In early days in England the 'freeholder' was obliged by law to give up land for the 'King's Highways' as required. Naturally each 'freeholder' was anxious to give as little as possible and so some of the roads became mere narrow tracks. The king, to rectify this, laid down that the road must be wide enough to 'turn a pyke in' and from time to time he sent 'pykemen' on the roads to 'turn' or swing round a pyke. If there were obstructions in the way of the pyke when 'turned' the respective 'freeholder' was fined. As a pyke was about 7 foot 6 inches long and was swung from the extended arm—it would appear that a 'turnpike' road was—and still is in England—about 20 foot wide."

Our thanks to Major Ross for this most interesting bit of highway history.

A judge asked a Negro in court: "Would you like a lawyer?"

"No, suh, I don't want no lawyer, but I suttenly could use a couple of good witnesses."

INDEX

FOR VOLUME XXVI

January to December, 1932, inclusive

NOW READY

SENT FREE ON REQUEST

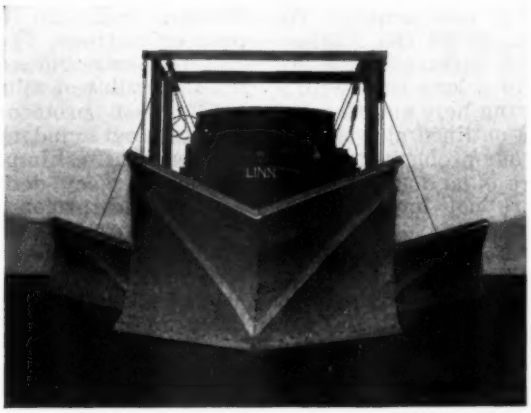
EXCAVATING ENGINEER

South Milwaukee Wisconsin

EQUIPMENT
You Ought to Know About

Linn Power Now Available for Snow Removal

TO ENABLE the Linn tractor to apply its massive power for snow removal, the Linn Manufacturing Corporation has recently announced a new Sargent hydraulically operated snow plow designed especially for use with the Linn.



Three levers lift the V and control the wings of both ends of the wing push arms. The power comes from a hydrualic pump mounted on the power take-off of the tractor. The wings may be kept flat for planing or sloped up for setting back banks. Whatever their position at the top of the lift they are always flat when on the ground. They can also be folded in out of traffic or lifted so high that an automobile can drive under them.

There is no piping between the tractor and the plow. The plow and wings can be de-mounted by pulling ten pins—a few minutes work. The Sargent super-suction cutter bars (patented) make the plow cut clean and the shape of the V as shown above makes it lift the snow and penetrate with maximum ease. The hook-up is so designed that the plow cannot "jack-knife". The big hydraulic jacks are powerful enough to lift the wings against snow without stopping the tractor, so that the wing man can keep the wing and nose in constant balance when plowing side banks of varying heights. Complete specifications and price may be obtained by writing the *Linn Manufacturing Corporation, Morris, N. Y.* Please mention this magazine when writing.

Tires for Wheelbarrows!

ENGINEERS for The B. F. Goodrich Company have recently designed low pressure tires for wheelbarrows. Patterned after airplane casings, the new tires constitute one of the few major changes made in wheelbarrow construction in many years.

With low pressure tire equipment, it is possible to propel loaded wheelbarrows in mud and deep sand where the old type wheels found motion difficult if not impossible. (Has there not been at least one time in the average reader's life when such a device was fervently prayed for?) Manual effort required to push a wheelbarrow is considerably reduced when low pressure tires are used, Goodrich tests have shown, and breakage, in many industries where this is a major problem, is also greatly reduced by use of rubber tired equipment. For complete information write *The B. F. Goodrich Co., Akron, Ohio.*

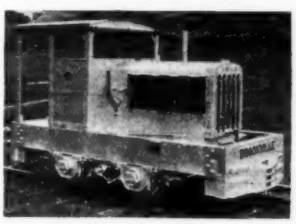
New 70-Pound Paving Breaker

ANNOUNCEMENT is made by the Gardner-Denver Company, Quincy, Illinois, of a new 70-pound paving breaker, the B-72. This machine has the new Gardner-Denver tubular-type short-throw face contact valve that is said to maintain efficiency indefinitely.

The air inlet is in the cylinder, not in the backhead and this feature, in combination with an air space between the handles and the head, keeps the handles cool. Air consumption of the B-72 is so low that a Class 120 portable compressor will operate two of these 70-pound breakers at highly effective working pressure according to the manufacturer.

A sheeting driver attachment with adjustable jaws; removable foot rests, and auxiliary holding handles are available. Only 1⅞-inch clearance is required for driving a second course of sheeting. For complete specifications write the manufacturer, mentioning this magazine.

"Caterpillar" Powered Brookville Locomotives



THE Brookville Locomotive Company has recently announced the standardization of "Caterpillar" Engines for their larger sizes of locomotives, which arrangement insures prompt shipment of any size of locomotive from 6-ton to 12-ton, and guarantees the engine service for which "Caterpillar" dealers are famous. For further information write *Brookville Locomotive Company, Brookville, Pa.*

EXCAVATING ENGINEER
FOUNDED 1906

A Monthly Publication Devoted to Excavating and Allied Subjects

REGULAR SUBSCRIPTION: $1.00 a year; Canada, $2.00 per year. SPECIAL SUBSCRIPTION: Upon application on card inserted in this number, Excavating Engineer will be sent frequently (not regularly) free of charge. Only for those engaged in the industry of excavation.

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The Business Situation

BUSINESS conditions have changed so little during the past month that a review of the present situation is very likely to repeat many statements made a month ago. Perhaps the most outstanding feature at the present moment is the discouraged feeling prevalent among business men and the appearance here and there of another feeling, that of surprise.

To many business men the psychological effect of the depression has been to gradually bring them to a point where pessimism rules their thoughts. They admit to themselves that they are finished, that there is nothing that can be done about it and they nervously await the climax which will be the end. And, during this waiting period in which their gloomy thoughts are not fulfilled, there is gradually born the realization that, perhaps, the worst fears are ungrounded, perhaps, the calamity is not scheduled to occur. They are surprised to discover that business is going on under conditions which, a year or so ago, would have been considered impossible. And this realization is a forerunner of new activity. Today we see one of the blackest psychological pictures that we have seen for a long time with a little scattering here and there of the reaction outlined above.

We have our problems to meet, of that there is no doubt, but the problems are not impossible of solution and the favorable characteristics of the moment are fundamental. The major problems confronting our country at the present moment are the balancing of the Federal Budget (the reduction of governmental expenditures, Federal, State and Civic), a settlement of the war debt question, a reorganization of tariffs, and the maintenance of sound money.

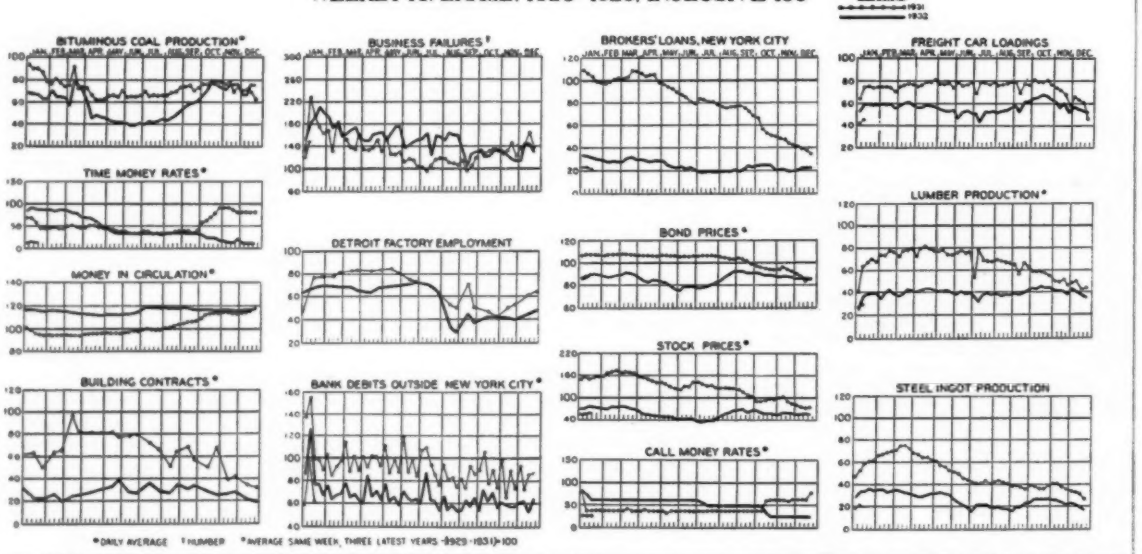
The severe reduction in national income which has taken place during the past three years prohibits further attempts to balance the budget by haphazard increasing of taxation. *The budget must be balanced.* If present fixed charges eliminate the possibility of balancing by a reduction of expenditures, some equitable form of taxation such as the sales tax must be devised to increase revenue and distribute the burden evenly. Private business has cleaned house, government must do the same. The next two problems—war debts and tariffs—are obstacles to foreign trade and the development of our country within the last twenty years has made foreign trade an essential to prosperous times. These are difficult problems but certainly are not impossible of solution.

The last problem — that of maintaining sound money—is of the very greatest importance. Artificial currency deflation measures can only prolong our difficulty and increase the seriousness of the problem. A rearrangement of the industrial financial structure may be advisable as a measure of bringing into line the so-called "fixed charges." Such readjustment would bring considerable inconvenience for many people but it is far more desirable than an attempt to artificially decrease the value of the dollar.

The favorable characteristics of the moment may be outlined as follows: the contraction of credit has virtually stopped and appears to be expanding at the present time. The volume of credit today is larger than it was six months

WEEKLY BUSINESS INDICATORS

WEEKLY AVERAGE, 1923-1925, INCLUSIVE=100



ago. Confidence in our country's banking system is bringing money out from hoarding and is causing the return flow of gold to the United States, a movement which has now been in progress for several months. The decline in business activity has practically stopped. The figures over the last six months period show in general a straight "side movement" and often an increase in activity. Price declines have stopped and stocks and bonds have shown an unusual firmness in maintaining the present level which is much above the low of last June. The stocks of manufactured goods are decidedly low, although it is true that the situation in regard to stocks of raw materials is not markedly better.

Contracts awarded for new construction in the 37 states east of the Rocky Mountains from January 1 through January 15, 1933 totaled $43,261,300 according to *F. W. Dodge Corporation.* During the corresponding period of 1932 $37,312,000 was reported.

The December construction contract total aggregated $81,219,300 contrasted with $105,302,300 for November, and $136,851,600 for December, 1931. Losses from November 1932 and December 1931 were shown for each of the four major construction classes except public utilities which showed an advance between November and December 1932 due chiefly to larger undertakings by railroads. In December gains were scored over November 1932 and December 1931 for factories, chiefly because of modernization work, and for educational buildings, while an increase was also shown for hospitals and institutions, but these gains were too small to counteract important losses in the remaining principal classes of non-residential building.

Residential awards in December showed a decline of about 32 per cent from the November total, and about the same decrease from December, 1931. Contracts let in December for public works totaled $36,866,200 as against $50,095,900 for November and $39,508,400 for December 1931. It is of interest to note that awards for highways, though smaller than in November were larger than in December 1931, and that contracts for new bridges showed practically no decline from December 1931.

For the full year 1932 contracts for all classes of construction totaled $1,351,158,700 as against $3,092,849,500 for 1931. Losses were general for each of the four major construction classes. Non-residential building declined almost 57 per cent from the 1931 total; residential building declined almost 66 per cent; public works suffered a loss of 41 per cent; while public utilities awards decreased almost 75 per cent.

Non-residential building losses from 1931 were in all principal types; commercial buildings and factories sustained the most significant declines while public and semi-public building, embracing educational structures, hospitals, institutions, and social and recreational facilities also recorded sizable losses from 1931. In residential building, apartments and hotels suffered relatively larger declines from 1931 than did 1 and 2-family houses.

Old Times & Old Timers

OUR OLD TIMERS section, established at the suggestion of Old Timer N. C. McGinnis, this month presents a letter from Old Timer T. F. McMenamin of Denver who tells what happened to an ancient Osgood on the building of the Tidewater and Deepwater. Says Mr. McMenamin:

"Travelling back to the yesterday of 1907, maybe you'll remember the construction of the Tidewater and Deepwater (now the Virginian). McArthur Brothers were the contractors and the machine was 'Old 17' a 65 Bucyrus. I do not recall the shop number but she was below 500. Jim Cunningham was runner, Ed Stevenson, boom cat. '17' was bought on the Missouri Southern in 1900, and this machine was still in operation in 1911 on the New York Aqueduct, owned by Yale and Reagen. I would like to hear from any of the old timers who operated this machine.

"Another old-time machine on the same project was the No. 1 Osgood. There were only two built of this type, railroad model, two and one-half yard bucket, especially built for McArthur Brothers for the Drainage Canal. This shovel had no swinging engine, the swing was from the hoisting engine—split drum, two hoisting chains, one around each side of the circle, up each side of the boom, and both attached to the bucket. To swing it was necessary to stop one or other of the hoist chains, depending on the direction of swing. One had to be an acrobat as well as an operator to handle this machine — your head was used to push the throttle, as both feet and hands were in use. Joe Robinson was the runner, Ed Greer the crane man. This was the same machine that Roderick McClure had operated on the Chicago Drainage Canal.

"In order to get rid of it on the Tidewater job, at Princeton, W. Va., it was necessary to use some strategy. The previous day a new Bucyrus 70, at the time quite an improvement over the 65, had arrived to be placed on another section of this work. For some cause (does any other old timer remember why?) the boom on the Osgood broke and Robinson and Greer got the new 70. And that No. 1 Osgood had the largest boom the Company ever put out!

"A few of the old timers that the writer worked with were:

(Continued on page 95)

MORE QUESTIONS

for Old Timers *by* Old Timers

QUESTIONS and information printed in the Excavating Engineer during the past few months has lead to some very interesting further questions. Here are some questions to which many an old timer will know the answer. Send along your letters, we will be more than interested to hear from you.

1. Back in the old days Mathews Bros. of Erie, Illinois, owned a Cross back-digger which operated in both Whiteside County, Illinois and in several towns in Iowa—Lake Park, Spirit Lake, Fonda, Algona, Superior, Pocahontas, Sibley, Spencer, Wooden and Titonka. Both Mr. Mathews and Ed. Lovejoy operated this machine. If you know of any other men who operated this machine send us their names. If you know of any other men who also worked on the jobs at these towns, let us have the story.

2. Who has a copy of the old Cross Catalog? If you have one please tell us about it. If you did have one tell us when you received it.

3. It is some 25 years ago that George A. Castle of Crookston, Minnesota used a Fairbanks back-digger with a two line control on some work in Montana. If you saw this machine work or know of people who did, let us hear from you.

4. Can anyone give us information on the "Kelgore" shovel described by Old Timer J. F. Sullivan in Excavating Engineer January issue?

SHOTS from the Firing Line

30th Annual Convention of American Road Builders' Association

DURING the week of January 16th the American Road Builders' Association held their 30th Annual Convention in connection with the Highway and Building Congress in Detroit. The early meetings of the convention were divided into various sessions devoted to specific subjects.

The session on pavements met Monday afternoon at the Municipal Airport under J. S. Crandell, Professor of Highway Engineering at the University of Illinois, and included reports of committees on asphalt pavements, brick pavements, reinforced concrete pavements and a talk on "Plain and Reinforced Concrete Pavements" by H. F. Clemmer, Engineer of Tests and Materials, District of Columbia. The County Highway Officials' Division meeting at the Airport was presided over by Howard B. Keasbey, Vice-President of the Northeastern District, and County Engineer, Salem County, New Jersey. The City Officials' Division met at the Statler Hotel with President Robert D. Brooks, Director of Streets and Sewers, St. Louis, presiding. The Manufacturer's Division met at the airport with President W. T. Chevalier of McGraw-Hill Publishing Company, presiding. A County Highway Officials dinner was held Monday evening at the Fort Shelby Hotel and President W. O. Washington, County Engineer, Cameron County, Brownsville, Texas, presided. The toastmaster was M. DeGlopper, Deputy Commissioner of Highways of Michigan and an address was given by J. W. Mavity, County Engineer of Harvey County, Kansas. Chairman of the Dinner Committee, LeRoy C. Smith, Engineer-Manager, Wayne County, Michigan, is to be complimented upon the excellent arrangements. On Monday evening was also the banquet for the delegates from Pan-American and European Countries. On the reception program appeared Lyle A. Brookover, Assistant Chief of the Foreign Construction Division of the Bureau of Foreign and Domestic Commerce; Leopoldo Farias, Director General of Highways of Mexico; George W. Farney, Director, European Division, American Road Builders' Association; and William H. Furlong, of the Chamber of Commerce of San Antonio, Texas.

The Tuesday sessions included a meeting at the Airport devoted to the subject of "Low Cost Roads" with P. M. Tebbs, Assistant Chief Engineer of the Pennsylvania Department of Highways, presiding. Chairman E. N. Gustafson, County Engineer, Matagorda County, Bay City, Texas, gave the report of the committee on the "Use of Concrete for Low Cost Road Construction." T. A. Person of the Fred T. Ley & Company, Inc., Springfield, Massachusetts, discussed "The Use of T. R. C. for Low Cost Road Construction." The report of the committee on Road-Mix and Aggregate types was given by S. E. Fitch, County Superintendent of Highways, Chautauqua County, New York, and the discussion was led by John T. Donaghey, State Highway Engineer of Wisconsin. The report of the committee on "Use of Emulsions" was given by J. E. Myers, Chief Chemist, Division of Engineering, Department of Public Works, Albany, New York. "A Farm-to-Market Program for Massachusetts" was discussed by L. O. Marden, County Engineer of Worcester County, and "The Preparation and Maintenance of Stabilized Gravel Roads" was discussed by W. R. Collings, Research Department, The Dow Chemical Company, Midland, Michigan.

The Highway Transportation session at the Shelby was presided over by H. C. Kelting of the Motor Truck Club of Kentucky and listened to an address on "The Social and Industrial Need of National Reciprocity and Uniformity in the Use of the Nation's Highways." The City Officials' Division met at the airport Tuesday morning with Vice-President Dudley T. Corning, Chief, Bureau of Highways, Philadelphia, presiding. Reports of committees were given and discussed by A. Harrington Place, Engineer, Detroit Bureau of Governmental Research; Robert H. Simpson, Chief Engineer, Department of Public Service, Columbus, Ohio; and Harry L. Shaner, Commissioner of Public Works, Winston-Salem, North Carolina. The meeting of the National County Roads Planning Commission at the Fort Shelby Tuesday morning was presided over by George W. Farny, Chairman, National County Roads Planning Commission, Morris Plains, New Jersey.

Included in the Tuesday afternoon sessions were meetings of the Highway Transportation session, City Officials' session, County Highway Officials' session and Committee on Road Conservation. The City Officials' Division section was presided over by J. M. Tippee, City Engineer, Des Moines, Iowa; and a report on maintenance entitled "Low Cost Residential Streets" was given by F. M. Davison, Maintenance Engineer of the District of Columbia. With R. Keith Compton, Director of Public Works, Richmond, Virginia, presiding, M. O. Eldridge, Assistant Director of Traffic, District of Columbia, reported on "What Does It Cost to Park?" and George B. Sowers, Consulting Engineer, Cleveland, Ohio, gave the report of the committee on the "Street Maintenance Economics."

At the County Highway Officials' meeting Hal G. Sours, County Engineer, Summit County, Akron, Ohio, presided while Howard B. Keasbey, County Engineer, Salem County, Salem, New Jersey, talked on "Low Cost Bridges"; F. H. Frankland, Director of Engineering, American Institute of Steel Construction, Inc., New York, discussed "Small Span Suspension Bridges," and C. N. Conner of the American Road Builders' Association reported on "Road Conservation." Mr. Sours' committee on Maintenance reported on "Equipment and Plant for County Highway Maintenance." At the four o'clock session W. O. Washington, County Engineer of Cameron County, Texas, presided and the general business of the Association was taken up. At the Congress Smoker at the Airport Tuesday evening a wrestling match and a band concert by the U. S. Naval Reserve Band were added attractions in connection with the Highway and Building Exposition and Road Show.

The Wednesday meetings included Equipment and Pipe culverts, Highway Transportation, Street Maintenance Economics, and Equipment. Of particular interest was a report on the "Compaction of earth fills as affected by type and size of haulage and other equipment" by a committee led by J. T. Ellison, Chairman. Mr. Ellison is Chief Engineer, Minnesota State Highway Department, St. Paul.

Thursday was Highway Congress day and consisted of general meetings of interest to all the National organizations interested in highway and building activities. The morning and afternoon sessions were held at the Masonic Temple. The morning meetings were presided over by Thomas H. Cutler, President of the American Road Builders and Chief Engineer of the Missouri State Highway Department. The first address was by W. T. Chevalier, Publishing Director of the civil engineering publications of McGraw-Hill. Mr. Chevalier talked on the "Highway Program of the Nation—Its Present Status and the Outlook for the Future." Thomas H. MacDonald, Chief, Bureau of Public Roads, gave us an address on "What Highways Mean in the Economic, Educational and Social Life of the United States." The final talk of the morning session was "Cost to the American Public of Diversion of Gasoline Taxes and Motor Vehicle Fees from Their Lawful Purpose," given by Ernest N. Smith, Executive Vice-President of the American Automobile Association and Vice-Chairman, National Highway Users Conference.

The afternoon meetings were pre-

sided over by O. W. Merrell, Director of the Ohio Department of Highways, Columbus, Ohio. Addresses were given by Martin L. Pulcher, of the National Automobile Chamber of Commerce on "Importance of Highway Transportation to Economic Recovery"; Chester H. Gray, American Farm Bureau Federation, spoke on "Interest of the Farmer in Adequate Highways," and Grover C. Dillman, State Highway Commissioner of Michigan, spoke on "A Balanced Highway Program."

The Congress Banquet was held Thursday evening at the Masonic Temple where Toastmaster Otho M. Graves, President of the General Crushed Stone Company, presided. Hon. Alben W. Barkley, United States Senator from Kentucky, gave an address entitled, "Who Are the Builders?" Henry I. Harriman, President of the Chamber of Commerce of the United States, spoke on "A National Program for Business Recovery" and Robert D. Kohn, General Chairman, Construction League of the United States, spoke on "Construction Faces the New Era." An enjoyable entertainment program was a memorable feature of the banquet.

General sessions Friday were held at the Statler and the morning meeting was presided over by E. J. Russell, President, American Institute of Architects. A discussion on "Unifying the Construction Industry" was led by A. G. Greensfelder, of St. Louis, Past President of the Associated General Contractors. Speakers under this subject included A. E. Horst of Henry W. Horst Company, who talked on the "Renovize Philadelphia Campaign," and J. Lionberger Davis of the Security National Bank on "Failure of Finance in the Field of Construction."

On Friday afternoon with President A. C. Tozzer of the Associated General Contractors presiding, E. J. Mehren, President of the Portland Cement Association, talked on "Economic Recovery via the Construction Route"; Col. D. H. Sawyer, Director of the Federal Employment Stabilization Board, spoke on "A Six-Year National Construction Program"; George B. Walbridge, Vice-President Walbridge-Aldinger Company, Detroit, discussed "Stimulating Construction Recovery by Proper Legislation"; and Robert D. Kohn, General Chairman of the Construction League of the United States, spoke on "Rebuilding Blighted Areas — Effect Upon Economic Conditions."

Altogether an overwhelming array of facts was presented against the tendency which exists in some quarters to curtail or cease road work and to cripple highway transportation. The Congress took a firm stand against the dole and those in attendance pledged themselves to demand that all communities wherever possible use relief money for planned useful work rather than for doles.

The Highway and Building Congress adopted this terse resolution: "We demand that the revenue raised from motor vehicle fuel taxes and license fees be used exclusively for highway construction and maintenance, and we oppose the diversion of these fees and taxes to other purposes."

A firm stand was taken on the continuance of Federal Aid: "We deplore the proposal that Federal Aid to state highway improvement be curtailed or suspended at this time, and we urge Congress to continue the Federal Aid policy by appropriating during the present emergency a sum equal to that appropriated last year, and in any event not less than the revenues from Federal taxes on gasoline and tires."

The emergency general sales tax was recommended to the states as a means of evenly spreading the costs of unemployment relief.

Eric: I see women's clothes have fewer buttons on them than they used to have.

Claude: Ah, yes. And women's buttons have fewer clothes on them than they used to have.

Status of Federal Aid

BILL S. 36 as passed by the Senate provides for an annual appropriation of $125,000,000 for each of the two fiscal years starting July 1st, 1933 and July 1st, 1934. From these would be deducted $16,000,000 annually to repay the $80,000,000 emergency appropriation of 1931 over a five year period.

The House Roads Committee recommended an amendment cutting the total to $100,000,000 annually, less the required deduction. The House will take up first this amendment and any others offered; then the bill itself. If the bill fails to pass before March 4th, all progress on the present bill is lost and a new bill will have to be introduced at the next Congress.

The U. S. tax of 1 cent per gallon on gasoline is estimated to bring in $154,000,000 annually. Federal taxes on sales of automobiles, accessories and parts, oil, tires and tubes is estimated to yield $100,000,000 annually. The total revenue from motorists is, therefore, $254,000,000 while the maximum asked for Federal Aid is less than half that or $125,000,000.

Forty-three state legislatures meet early this year and will find it difficult to make plans for state highway appropriations pending Congressional action on Federal Aid. The example of the Federal Government will influence largely the decisions of states, counties and cities not only in matching Federal Aid but in making all appropriations for road work.

National Crushed Stone Association Holds 16th Annual Convention at Book-Cadillac, Detroit

A VALUABLE and interesting program was presented to the delegates to the National Crushed Stone Association's 16th annual convention held at the Book-Cadillac Hotel, Detroit, on January 16th, 17th and 18th.

At the Monday morning session with A. L. Worthen of New Haven, Connecticut, President of the Association, presiding, an interested audience listened to Mr. Worthen's presidential address, the reports of directors on business conditions, and an address by George E. MacIlwain, Business Economist and Lecturer. A greeting or get-acquainted luncheon followed with Vice-President Russell Rarey of the Marble Cliff Quarries Co., Inc., Columbus, Ohio, presiding. Billy B. Van of Newport, N. H., addressed the luncheon group on "Sunshine in Business."

The Monday afternoon session was presided over by Treasurer Arthur S. Lane of the John S. Lane and Son, Inc., Meriden, Conn. Maurice Holland, Director, Division of Engineering and Industrial Research, National Research Council, New York City, spoke on "Research—Industrial Insurance." E. M. Fleming, Manager Highways and Municipal Bureau, Portland Cement Association, Chicago, spoke on "The Cement-Bound Macadam Road," followed by a discussion led by J. H. Bixby, District Engineer of the New York State Highway Department of Poughkeepsie, N. Y., and Ernest Ashton, Chemical Engineer, Medusa Portland Cement Co., Wampum, Pa. An address on the use of crushed stone for widening highways by Fred Swineford, Chief Engineer of the Ohio Crushed Stone Association, Columbus, was followed by a discussion led by George Martin, Consulting Engineer, Tarvia Dept. of the Barrett Company, New York. C. B. Porter, Resident Engineer of the Chesapeake and Ohio Railroad Co., at Clifton Forge, Va., gave a talk on the use of stone sand in the Big Bend tunnel on the Chesapeake and Ohio Railroad. The building of this tunnel by Haley, Chisholm and Morris was described in the October 1931 issue of Excavating Engineer. The following discussion was led by F. O. Biehn of C. C. Beam, Inc., Melvin, Ohio.

With Wm. E. Hilliard, General Manager of the New Haven Trap Rock Company, New Haven, Conn., presiding, addresses at the Tuesday morning session opened with an address by George D. Bailey of Ernst and Ernst, Detroit, Michigan, on the Readjustment Era and Its Relations to Plant Value and the following discussion was led by Mr. Hilliard. A talk on Standardization of Sizes by F. H. Jackson, of the U. S. Bureau of Public Roads was followed by a discussion led by R. R. Litehiser, of the Bureau of Tests, Ohio Department of Highways. A. T. Goldbeck, Director, Bureau of Engineering, National Crushed Stone Association, spoke on his department's value to the crushed stone industry and

the ensuing discussion was headed by J. A. Rigg, General Manager of the Acme Limestone Co., Alderson, W. Va.

Various present difficulties which confront the industry today were discussed in the afternoon session Tuesday with Otho M. Graves, President of the General Crushed Stone Company, Easton, Pa., presiding. Mr. Goldbeck discussed the development of wayside plants and John Rice, Jr., V. P. in Charge of Sales of the General Crushed Stone Company talked on wayside competition as viewed by the large commercial plants. Transportation by rail and truck was compared by J. M. Fitzgerald of the Committee on public Relations of the eastern railroads. "Stabilization and the Anti-Trust Laws" was the subject of an address by Gilbert H. Montague, New York Attorney. An interesting talk followed on "Organizing to Combat Gas Tax Diversion," the speaker being Thomas E. Wright, Executive Secretary, New York State Construction Council, Rochester, N. Y. The discussion which followed was led by Wm. B. Guitteau, Counsel, Ohio Crushed Stone Association and Editor of Better Highways.

President Worthen presided at the Wednesday morning session which opened with a talk by Dr. F. W. Lee of the Geophysical Section, U. S. Bureau of Mines, on the development of apparatus for measuring intensity of ground vibrations from quarry blasting. Scott Turner of the U. S. Bureau of Mines presented awards for the National Crushed Stone safety contest and the acknowledgment was made by A. R. Couchman of the North American Cement Corp., Martinsburg, W. Va., who were winners of the trophy. Reports and election of officers followed. The present national officers were re-elected for another term.

Wednesday afternoon was devoted to inspection of the joint exposition. Among the exhibitors were Allis-Chalmers Manufacturing Company, Blaw-Knox Company, Bucyrus-Erie Company, General Electric Company, Hercules Powder Company, A. Leschen & Sons' Rope Company, Nordberg Manufacturing Company, Sauerman Brothers, Inc., and other well-known manufacturers.

The balance of the convention consisted of joint meetings with the American Road Builders' Association and other associations participating in the Highway and Building Congress.

Sand and Gravel Men Discuss Problems at Detroit Meeting

THE SPECIAL meetings for members of the National Sand and Gravel Association were held at the Book-Cadillac Hotel, Detroit, on January 17th and 18th. Registration was followed by an address by H. V. Owens, President, of Utica, New York. Mr. Owens gave a detailed review of activities of the Association in 1932 and outlined the proposed program for 1933 activities. A general discussion followed on "Business Conditions in the Sand and Gravel Industry" including five minute discussions by sand and gravel producers representative of the United States and the Province of Ontario on the following questions: (1) conditions in the highway, general building and ballast markets in 1932 and prospects for 1933; (2) the general competitive situation; (3) trend between large plants and small plants particularly as to the future of the sand and gravel market; (4) changes in production methods which have brought about lower costs. This general discussion was led by: Paul P. Bird, H. P. Caldwell, Otto S. Conrades, Alex. W. Dann, Alex Foster, Jr., John J. Gallagher, Walter F. Jahncke, W. H. Klein, M. G. Kerr, Otto Kuehn, Jr., T. E. McGrath, F. W. Peck, Robert J. Potts, G. G. Robinson, J. L. Shiely, H. N. Snyder.

After lunch the afternoon session, under presiding officer J. C. Buckbee of Chicago, Vice-President of the Association, listened to an address on "Prospects for a Ballast Market in 1933" by H. R. Clarke, Engineer Maintenance of Way, C. B. and Q. System, Chicago. With the ballast market accounting for about one-third of the business of the industry in normal years and practically inactive during the last two years, Mr. Clarke's discussion was of particular interest. "Plant Inspection of Aggregates Under Modern Specifications" was the subject of a paper by W. J. Emmons, Director, Michigan State Highway Laboratory, Ann Arbor. An interesting discussion followed in which Stanton Walker, Director, Engineering and Research Division, Washington, D. C., outlined the problem presented by "Competition from Local Plants and Methods of Meeting It." The viewpoint of the Sand and Gravel producers was presented by: John Prince, Stewart Sand and Material Company, Kansas City, Missouri; C. Gray, American Aggregates Corporation, Indianapolis, Indiana; J. Rutledge Hill, Gifford-Hill and Company, Dallas, Texas; A. E. Frosch, Secretary, Ohio Sand and Gravel Association, East Liverpool, Ohio. The angle of the highway engineers was presented by H. P. Chapman, Assistant Director and Chief Engineer, Ohio State Highway Department, Columbus, Ohio. During this discussion particular emphasis was given to the intelligent programs which have been launched in three states to resist the use of inferior materials from temporary plants.

The Wednesday morning session was presided over by Alexander Foster, Jr., of Philadelphia and opened with a discussion of "Marketing Problems in the Sand and Gravel Industry," the question being presented by V. P. Ahearn, Executive Secretary of the Association. Discussion of practical possibilities of sales companies, mergers and voluntary efforts through local associations, was given by W. A. Bliss, President, the Sand and Gravel Company of Pittsburgh, Pittsburgh, Pennsylvania, and V. O. Johnston, President, the Lincoln Sand and Gravel Company, Lincoln, Illinois. Attorney William P. Belden gave a talk on "What Revisions in Anti-Trust Laws Are Necessary to Permit of Economic Planning in the Sand and Gravel and Allied Industries?" "What the National Sand and Gravel Association Has Saved Its Industry" was the subject of a talk by John Prince, President, Stewart Sand and Material Company, Kansas City, Missouri. Mr. Prince, a Past President of the Association and a leader in its work for many years, not only discussed the savings which the National Association has made for the industry but also the unlimited possibilities for its future.

The Wednesday afternoon meeting was devoted to an inspection of the Joint Exposition.

Mr. Owens was re-elected president; Mr. Buckbee, vice-president; and Mr. Davison, secretary-treasurer. M. A. Neville of the Western Gravel Company, Lafayette, Indiana, and W. H. Klein of the Dixie Sand and Gravel Company, Chattanooga, Tennessee, were elected to the executive committee to serve with Paul P. Bird and Alexander Foster, Jr., who continue on this committee.

National Ready Mixed Concrete Association Holds 3rd Annual Convention

PARTICIPATING in the Highway and Building Congress, the National Ready Mixed Concrete Association, Inc., of Washington, D. C., held the meeting devoted exclusively to this industry on Wednesday, January 18th. The sessions opened Wednesday morning under Treasurer J. I. Shiely of the Guaranteed Concrete Company, St. Paul. Following the registration H. F. Thomson, Vice-President, General Material Company, St. Louis, and Vice-President of the Association, reviewed the work of the Association and its accomplishments in behalf of the industry it represents. R. B. Young, Consulting Engineer of Toronto, Ont., Canada, Vice-President of the Association, outlined the purchase specification now being considered by the American Society of Testing Materials and discussed the various factors which must be taken into account in writing such a specification. "Use of Ready Mixed Concrete in Highway Construction" was the subject of a paper given by H. P. Chapman, Assistant Director and Chief Engineer of the Ohio State Highway Department. Miles N. Clair of Thompson & Lichtner Company, Consulting Engineers, Boston, Mass., discussed the control of ready mixed concrete in cold weather.

At the afternoon meeting, with Vice-President Paul P. Bird of the Boston Concrete Corporation presiding, an open forum was held with five minute discussions by ready mixed concrete producers on the following questions: (1) Demand for ready mixed concrete in 1932 and 1933; (2) Competitive situation in locality represented; (3) Average haul; (4) Use of ready mixed concrete in street and highway con-

Consider Its Record!

After all is said and done—results are what count, and that is why we ask you to consider the actual service record of "HERCULES" (Red-Strand) Wire Rope.

"HERCULES" is economical because it is extra long lasting, and its long life is not a matter of chance or guess but the result of definite and specific causes—developed by us during our seventy-five years of rope making.

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Shots From the Firing Line— *Continued*

struction; (5) Trend in use of agitators or truck mixers; (6) Selling on guaranteed strength basis. Leaders in the discussion were A. C. Avril, Paul P. Bird, A. W. Bowie, S. V. Chandler, Alexander Foster, Jr., L. H. Gross, Louis F. LeHane, Robert Rosser, J. L. Shiely, H. F. Thomson and R. B. Young. This open forum was followed by an address by W. D. M. Allen, Manager of the Cement Products Bureau of the Portland Cement Association on the future demand for concrete. At the business meeting, H. F. Thomson was elected president for the coming year and L. H. Gross of the York Concrete Company, of York, Pennsylvania, vice-president. During the remainder of the convention the National Ready Mixed Concrete Association joined the general session of the Highway and Building Congress.

Looks Like Twenty Million for Flood Control; Thirty-nine Million for Rivers and Harbors

THE WAR DEPARTMENT appropriations bill now under consideration by the House of Representatives provides $20,001,424 for Mississippi Valley Flood Control. Of this $19,653,424 is to be used for the main project and $348,000 for work on the tributaries. The appropriation for rivers and harbors is set at $39,388,129. These figures are the usual amount less the Relief act funds advanced last fall.

At this writing it looks as though these items will carry through safely at this session and if so the funds will probably be available early in February which will permit an early start on lettings and contracts compared with last year when funds were issued till Mid-July.

Foreign

China Notes

A pretentious **national road construction and unification program**, for the building and maintenance of 11 trunk highways connecting major cities throughout China, was drafted and approved at the Seven Province Highway Conference held at Hankow, November 2, 1932. The entire project was endorsed by the Chinese Generalissimo, under whose auspices the Convention was held. The provinces represented by delegations were: Kiangsu, Chekiang, Kiangsi, Anhwei, Honan, Hupeh and Hunan.

As we go to press the National Government is organizing a lottery providing for the issuance of 500,000 irredeemable bearer bonds at $10.00 (Shanghai) each. Fifty per cent of the resulting funds will be distributed as prizes. The balance of 2,500,000 Shanghai dollars will be **used for the promotion of aviation and highways.** Regulations provide for four of these lottery bond issues yearly.

Hawaiian Notes

By PERRY H. KRAFT

Benjamin F. Rush, assistant territorial supervisor of public works is expected to become the new city and county engineer at Honolulu. The new Democratic board of supervisors have said that they will refuse the re-appointment of H. A. R. Austin, the incumbent. Mr. Rush has also been tendered the post of county engineer of Kauai, which pays approximately the same as that of Honolulu.

Hawaiian Contracting Company submitted low bid of $289,558 for construction of the Kula Road on the island of Maui, a federal road project. Road is about six miles long and sixteen feet wide; while contract includes all paving and grading and construction of seven bridges.

It is expected that the new Democrat board of supervisors will **ask $2,500,000 for public work to aid the jobless**, for the year commencing July 1st. Much work has been accomplished thus far, in the parks under the supervision of the city engineer. Grading, sodding and planting of trees has been the principal items.

E. E. Black, Ltd. was low bidder on the improvement of the Pacific Heights water work system, with a bid of $80,265. They were also low on an alternate bid, adding only $4,000 to the original. This was asked so that help could be used on a 30 hour a week basis, in an endeavor to assist the employment situation. Improvement calls for the installation of six and eight inch water mains, and automatic pumping plant and construction of two reservoirs of 200,000 and 300,000 gallons capacity.

If Dame rumor is right Honolulu will soon have **two new parks**, to be built under the supervision of the city engineer. One location next to the ocean and below sea level, would be filled from surplus dirt from the other site which would have to be graded.

New England Notes

By C. BRUCE McCOWN

C. M. Callahan, Inc. of West Roxbury, Mass. was low bidder on the Cohasset-Scituate road job. About 200,000 cubic yards of excavation and borrow are to be handled on this job.

The Eastern Contracting Co. was awarded the Middleboro-Taunton job. This section of road is to connect the cities of Taunton and Middleboro, Mass. and is almost entirely new location. Some 300,000 cubic yards are to be moved on this job.

S. W. Lawrence, Folmouth, Mass., was awarded the Yarmouth job on Cape Cod. This job completes the cutoff to the town of Yarmouth and involves some 50,000 cubic yards of excavation and borrow.

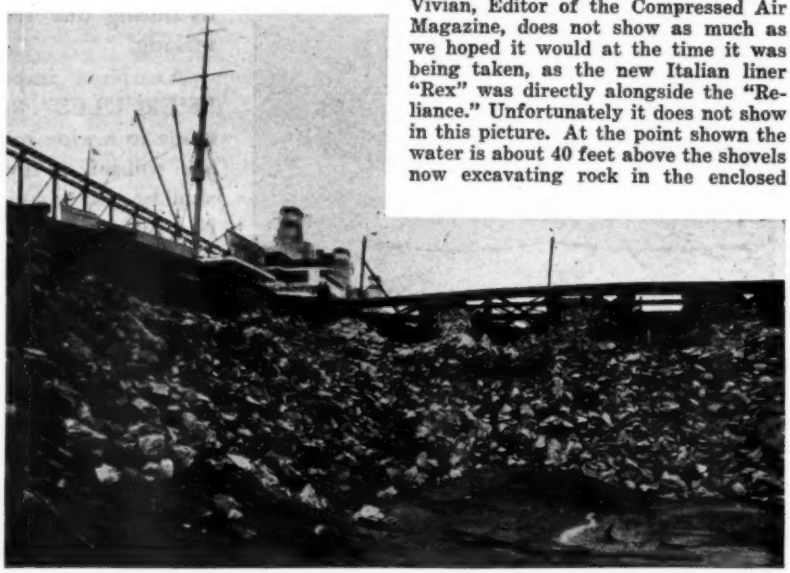
D. Arrigoni, Middletown, Conn. was awarded the Seymour and Oxford job in Connecticut. This job has about 60,000 cubic yards of earth excavation and about 50,000 cubic yards of ledge.

Callan Construction Co., Bristol, R. I. was awarded the Portsmouth, R. I. job with about 40,000 cubic yards of excavation and borrow.

New York Notes

By J. W. FAWCETT

The accompanying picture shows the "S. S. Reliance" docking alongside the cofferdam built by **Allen N. Spooner & Son, Inc.**, in connection with construction of Piers 88, 90 and 92 at the foot of West 48th, 50th and 52nd Streets on the west side of Manhattan Island. The unusual size of this cofferdam (it is the largest in the world and the construction was described in detail in June, 1932, Excavating Engineer) has attracted considerable attention. More than 700,000 square feet of the bottom of the North River are enclosed by the dam and uncovered to a maximum depth of 46 feet below mean low tide. 120,750,000 gallons of water behind the cofferdam had to be pumped out before it appeared as we see it in the picture. The picture, furnished through the courtesy of Mr. Vivian, Editor of the Compressed Air Magazine, does not show as much as we hoped it would at the time it was being taken, as the new Italian liner "Rex" was directly alongside the "Reliance." Unfortunately it does not show in this picture. At the point shown the water is about 40 feet above the shovels now excavating rock in the enclosed



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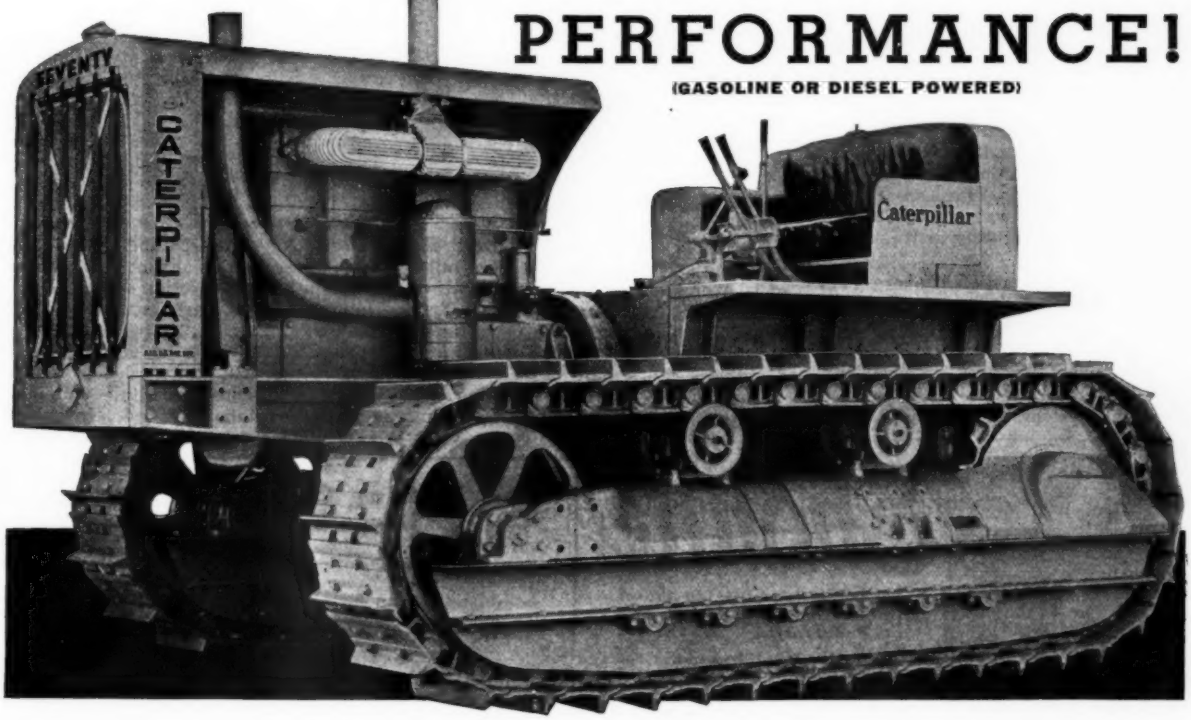

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Shots From the Firing Line—*Continued*

area. Should one of these big steamers get a bit off the course in a fog and "crash the gate"—well let's just not think about it.

A contract amounting to $300,000 has been awarded by Baltimore & Ohio (Staten Island Rapid Transit) to the **Bates & Rogers Construction Company**, New York, for excavation, masonry, grading, paving, etc., required in connection with elimination of grade crossings on the line of the Staten Island Rapid Transit between Grasmere and Dongan Hills, Staten Island, New York.

Fitzgerald Brothers Construction Company, Inc., of Troy, was low bidder at $356,505 on 12.61 miles of highway in Washington County.

Morrell Vrooman, Incorporated of Gloversville bid low of $53,306 on .12 mile on Highway 5601 to Saugerties Village in Ulster County.

A. E. Ottaviano, Incorporated of Croton-on-Hudson was low at $288,282 on 4.78 miles of highway in Westchester County.

Thomas A. Brogan of Yonkers made the low bid of $143,880 on 2.66 miles of Highway 5231 in Westchester County.

Christopher Brothers of Peekskill were low bidders with $198,530 on 3.25 miles in Westchester County.

Buffalo and Vicinity

BY M. E. FRANKLIN

WILLIAM J. LAW

We regret to learn of the death of William J. Law, a member of the firm of Law Brothers Contracting Company, Herkimer, N. Y.

Mr. Law was born in Fairfield, N. Y., July 2, 1874. In 1906, with his brother, Pierce Law, he organized the Newport Construction Company. About 15 years ago the name was changed to Law Brothers Company, with Mr. Law as President, and the firm, operating from Herkimer, N. Y., constructed many highways, bridges and power plants.

We understand that **George Brooks**, who has been operating for Charles Chetwin, Syracuse, N. Y., was injured in an automobile accident and has been confined to the hospital for some time. We are very sorry to learn of his injury and hope that by this time he is well on the road to recovery.

Michigan Notes

BY CLYDE B. DAVIS

Contracts have been awarded for widening and deepening the eight miles of what is known as the eastern half of **Lake St. Clair Channel**, and Maj. R. C. Crawford, U. S. District Engineer at Detroit, says bids will be invited soon for the western half of the channel.

The Duluth-Superior Dredging Co. was the low bidder for the deepening of the channel from 21 feet to 27 feet for its width of 800 feet, in the three-mile length below St. Clair Flats Canal. The bid was $209,694.

The five miles of channel from the front range of Peche Island light, lakeward, will be made 27 feet deep and 400 feet wide. **The Great Lake Dredge & Dock Co.**, of Chicago, was awarded the job for $198,400.

Work will be started early in the spring, Maj. Crawford said.

The following road construction awards have been approved by the State Administrative Board:

Huron county—3.523 miles grading and draining structures on M29, southwest of Port Austin, to **Louis Garavaglia Co.**, Detroit, $21,523.

Delta county—2.614 miles grading and drainage, on US 2 and 41, from Rapid River west and south, to the **Bacco Construction Co.**, of Iron Mountain, $13,203.

Iron county—6.117 miles grading and drainage on US 2 from near Iron River to Beechwood, to **Bacco Construction Co.**, $64,644.

Marquette county—.522 mile, grading and drainage, on M 28 and US 41 from the intersection of Front and Fisher Sts., south to intersection of Marole and Hampton Sts., Marquette, to **L. W. Brumm**, Marquette, $33,747.

No more contracts for state highway construction will be awarded to **county road commissions**, the State Administrative Board has decided. This deci-

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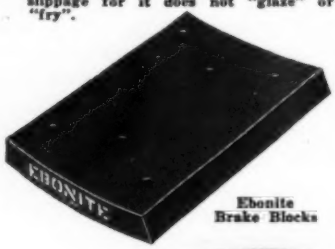

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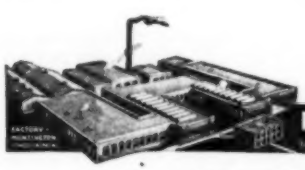

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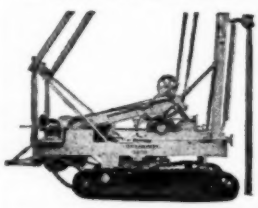

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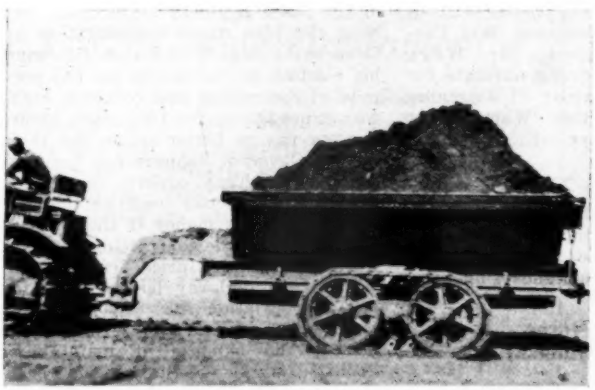

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Shots From the Firing Line— *Continued*

sion follows protests from highway contractors, who insist that they need all the business available if they are to keep their men employed. In the last three years the Wayne County (Detroit) Road Commission has received contracts for state work amounting to $1,700,000.

Illinois Notes

Conrad Ottenhoff of Chicago, Illinois with a bid of $37,170 was awarded the contract for grading section 102YA in Cook County.

Clark-Kearney & Stark of Rockwood, Illinois was awarded the contract for grading section 121A in Randolph County. Their bid was $35,693.

O'Connor Construction Company of Springfield, Illinois with a bid of $54,146 was awarded the contract for grading section 112A in Knox County.

St. Louis and Vicinity

By A. J. KOENIG

The St. Louis County Court awarded contracts for the construction of twelve sections of road, comprising approximately 14½ miles of paving, at a cost of $553,259. This is $140,000 below the engineer's estimate. All the projects call for grading, drainage and 20-foot concrete slab. The Court specified that machinery be used in the projects to effect a saving of $170,000. At the previous letting the specifications called for hand labor only.

Construction of a super-highway for the relief of congestion on the present state highway No. 40, from St. Louis to Wentzville through St. Louis and St. Charles county, will cost approximately $3,000,000. The plans call for a four-lane highway in St. Louis county tapering to a width of 30 feet as the Missouri River is approached. The bridge to be erected near Weldon Springs will carry a 30-foot roadway. From the bridge through St. Charles county to Wentzville the highway will be the standard 20-foot slab with provisions for ultimately widening to 30 feet. The length of this new road will be approximately forty miles. Engineer T. H. Cutler states that work will likely be started this year as right-of-way difficulties along the route have been adjusted.

S. J. Cohen was low with a bid of $206,228 for construction of a 4645-foot reinforced concrete and steel bridge over the Marked Tree, Arkansas, Floodway, and two miles of grading and gravel surfacing, Marked Tree-Truman highway.

Jansen & Schaefer were awarded contracts for three section of pavement in Tazewell county, Illinois. The Vincennes Bridge Company has contracts for the construction of two bridges in Champaign County.

Missouri Notes

F. T. O'Dell of Hannibal, Missouri was awarded the following contracts on Jan. 10th: grading 3.649 miles on project SD-2 in Audrain County, grading 3.932 miles on project SD-3 in Audrain County, grading 3.340 miles on project SM-1 in Gasconade County, grading 4.203 miles on project SJ-1 in Monroe County, grading 4.554 miles on project SV-1 in Ralls County, grading 4.986 miles on project SB-5 in Washington County.

C. L. Johnson of Warrensburg, Missouri was awarded the following: grading 1.976 miles on project SN-1 in Buchanan county, grading 2.216 miles on project SN-2 in Clinton County and grading 1.070 miles on project SF-1 in Randolph County.

Harrison Engineering and Construction Corporation of Kansas City, Missouri was awarded: 20-foot concrete on 4.020 miles on project 160-E366C in Barton County, 20-foot concrete on 4.215 miles on project 160-E366D in Barton county, 20-foot concrete on 4.702 miles on project 71-E368A in Nodaway County, 20-foot concrete on 4.916 miles of project 71-E368B also in Nodaway County.

C. H. Atkinson Paving Company of Chillicothe, Missouri was awarded the following contracts: 10-foot concrete on 1.900 miles of project 10-E367-D in Carroll County, 10-foot concrete on 5.000 miles of project 10-E367E in Carroll County, 10-foot concrete on 4.960 miles of project 10-E367F in Carroll County; 3.811 miles of 10-foot concrete on project 10-F367A in Ray County and 4.186 miles of 20-foot concrete on project 60-E365A in Webster County.

Kansas Notes

Operator **A. H. Welch** of Pittsburgh, Kansas is running a Bucyrus-Erie 225-B for the Eagle Coal Company. Wm. Parriott is Superintendent. Mr. Welch writes that he is a strong advocate for Bucyrus-Eries and adds: "I am going to make the assertion 'When better shovels are built Bucyrus-Erie will build them'."

Southern Notes

G. S. Pritchett of Rome, Georgia who is now employed by the Floyd Company as Master Mechanic asks us to say "Howdy" to all his old shovel operator friends.

River Notes

By W. W. WHORLEY

Here is a picture of work on a recently completed enlargement job of the **Canal Construction Company** located near Endora, Ark. A Bucyrus-Monighan 6-yard walking dragline with 165-foot boom put the dirt in place and the two yard Bucyrus-Erie followed on top of the levee doing the finishing.

New Orleans District

W. E. Callahan of St. Louis, Missouri was the low bidder at the New Orleans letting on January 3rd for constructing 1,140,000 cubic yards of the Lobdell-Viola levee located near Port Allen, Louisiana at a price of 8.88 cents per yard. The Government estimate was 12.52 cents.

20,498 linear feet of wooden revetment was let in the New Orleans District on same date, January 3rd, in the Barataria Levee District.

Vicksburg District

Boyce & Igo took the entire 2,185,000 yards of the January 12th letting at 8.59 cents per yard. Five projects were included and thirty contracting firms bid. The work is on the south bank of the Arkansas River near Pine Bluff, Arkansas. Included are 1,325,000 yards of new levee, 323,000 yards enlargement, 185,000 yards construction turnover, 241,000 yards riverside enlargement, 6,000 yards landside enlargement, 60,000 yards lake crossing and 18,000 yards in dike enlargement. The limit is 300 days.

66,000 cubic yards on the east bank of Ouachita River fifteen miles north of Monroe, Louisiana went to **F. D. Harvey & Company** of Jonesboro, Arkansas at 8.74 cents. This has a 60 day time limit for completion.

Colorado Notes

By H. M. BIBAUD

Maintenance of state highways by private contractors and the practical abolition of the Maintenance Division of the State Highway Department has been the plan under consideration by Governor Edwin C. Johnson following his election in November for the purpose of controlling and reducing highway expenditures for 1933 while insuring tax payers better values for their money. Governor Johnson has been assured by highway experts that roads can be kept in better condition the year around, for less money if the work is turned over to the contracting companies at a stipulated price per mile.

The 1933 highway budget calls for an appropriation of $1,600,000 for maintenance of Federal Aid roads, only, besides the expense of maintaining about 5,000 miles of State highways by the counties. Highway experts agree that so far as construction work is concerned, the state is receiving satisfactory values for the funds expended.

The $1,125,000 loan recently approved by the Twin Lakes Reservoir and Canal Company of Colorado, has established a precedent which will result in the extension of Federal Aid to self liquidating reclamation projects, according to recent dispatches from Washington.

A. E. Palen of Denver, District Engineer of the United States Bureau of Public Roads for Colorado, Wyoming and New Mexico, has been promoted to take charge of a larger district with headquarters at St. Paul, Minnesota, it was announced, January 12. Mr. Palen's new district will include Minnesota, Wisconsin and North and South Dakota.

J. W. Johnson, formerly district engineer in Denver, will succeed Mr. Palen in the Colorado-Wyoming-New Mexico district. For the last three years Mr. Johnson has been assigned to the work of constructing the boulevard from Washington to Mount Vernon.

New Mexico

At the letting on January 16th, **Kersey & Company** of Alamogordo, were low with a bid of $42,909 on project 165-A.

A. O. Peabody of Las Cruces was awarded project 87 under bid of $100,-421.

J. H. Miller of Denver secured the two units in project 107-A with bids of $93,422 and $118,813 respectively.

The bidding on project 151-A was postponed and bids on project 20-A-B were still under advisement.

Nevada Notes

Olof Nelson of Logan, Utah, was awarded contract for $159,209 on the State Highway in Clark County through Las Vegas.

Union Paving Company of San Francisco secured the reconstruction job on the section of highway in Washoe County between Huffaters and Reno.

Oregon Notes

Bids were received on January 25th at Portland on a number of Oregon highway grading jobs. These included the Clackamas River-Canemah Section of the Pacific Highway where 1.1 miles of highway roadbed requires 65,000 cubic yards of rock excavation; the Koepke Slough of rock excavation; the sections of the Umpqua Highway consisting of 32,500 cubic yards of excavation in 2,100 lineal feet of grading and gravel surfacing; the Drinkwater Pass Section of the Central Oregon Highway which requires 75,000 cubic yards of excavation on 0.89 mile of grading; the Bear Creek-Ashland Section of Pacific Highway of 1.5 miles of grading requiring 75,000 cubic yards of excavation and which is also to be paved with 18,500 square yards of concrete; the Honey Ranch-Dolph section of McMinnville-Tillamook Highway with 1.25 miles of grading and surfacing requiring 54,000 cubic yards of excavation and 15,000 cubic yards of gravel.

San Francisco and Vicinity

By H. L. LIVINGSTON

Frank C. Cuffe of San Raphael, has been awarded contract in the amount of $97,281 by the U. S. Bureau of Public Roads for grading 3.2 miles of the Deer Creek Meadows National Forest Highway in the Lassen National Park, Tehama County, California.

Bids will be received up to February 28 at the State Capitol Building, Sacramento, for contract No. 2 which is the substructure, West Bay Crossing between San Francisco and Yerba Buena Island, for the **San Francisco-Oakland Bay Ridge.** Additional bids covering further work for this bridge will be called for shortly.

M. J. Bevanda of Stockton, California, who bid $173,378 was low bidder to the California Division of Highways for 5 miles of grading and concrete paving south of San Ardo in Monterey County.

J. P. Holland of San Francisco, who bid $402,667 has been awarded the contract by the California Division of Highways for 4.1 miles of grading and paving in Los Angeles County, the principal item in this contract being 800,-000 cubic yards of roadway excavation.

Contract was awarded to the **West Slope Construction Company** for the construction of San Gabriel Dam No. 1 in Los Angeles County. The amount of this contract is $8,600,527. This Dam will be of the rockfill type, 270 feet above stream bed, with very flat slopes on the downstream face and with a capacity of 70,000 acre feet. The West Slope Construction Company consists of Foley Brothers Incorporated, Bates & Rogers Construction Company, J. C. Maguire and the Lawler Corporation.

The Board of Directors of the Metropolitan Water District of Los Angeles have decided to start work at once on a force account basis on the **West Coachella Tunnel** and the **East Coachella Tunnel.** The combined length of these two tunnels is approximately 33 miles and the estimated cost for this project is $18,000,000.00. The completion date set for these tunnels is 5½ years. James Munn of the Metropolitan Water District will be general superintendent of construction.

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1932—Highway Construction—1933

(Continued from page 73)

Kern—6.8 mi. grading, paving and bridges So. boundary to Oak Glenn	752,000
Lake—4 mi. grading, surf. and bridges Middletown to 4 mi. northerly	223,500
Los Angeles—0.6 mi. grading, paving and structures Los Angeles West City limits to Beverly Blvd.	100,000
Los Angeles—0.2 mi. grading, paving and structures west channel road to Santa Monica	20,000
Los Angeles—4 mi. grading and surfacing Colby Canyon to Mt. Wilson Road	420,000
Los Angeles—Cooperative grading State's share San Gabriel Canyon	113,000
Los Angeles—4 mi. grading and paving Orange Ave. to Barranca St.	180,000
Los Angeles—Grade Separation at El Monte	90,000
Los Angeles—3.2 mi. grading, paving and bridges near Newhall to Saugus	75,000
Los Angeles—0.6 mi. grading, paving and bridge Saugus to Williams Ranch	37,000
Los Angeles—3.3 mi. grading and paving Calabasas to W. Boundary	132,000
Los Angeles—1.4 mi. grading and paving Williams to Seeley's Ranch	70,000
Los Angeles—10.6 mi. paving the Oaks to Acton Road	152,000
Los Angeles and Kern—24 mi. grading and paving Lancaster to Mojave	220,000
Los Angeles—3.3 mi. grading, paving and bridges Big Tujanga Wash to Tujunga	114,000
Los Angeles—5.4 mi. grading and paving Santa Clara River to Castaic School	150,000
Los Angeles—8.8 mi. grading, paving and bridges Ramirez Canyon to Encinal Canyon and Las Flores Canyon to Winter Canyon	502,500
Los Angeles—10.8 mi. grading, paving and bridges Winter Canyon to Ramirez Canyon and Encinal Canyon to West Boundary	821,500
Mariposa—15 mi. surfacing Orange Hill School to Mariposa	275,000
Mendocino—Grading, surfacing and bridges MacDonald to Navarro (portions)	60,000
Merced—3.3 mi. grading and surfacing west Boundary to foot of Pacheco Pass Grade	260,000
Modoc—2.6 mi. grading and surfacing Alturas to Cedarville (portions)	81,000
Mono—6.3 mi. grading, surfacing and structures Point Ranch to Dressler's Corner	117,180
Mono—15.3 mi. grading Yosemite Park boundary to Mono Lake (portions)	248,125
Mono—9.8 mi. grading and surfacing Crestview to 2.2 mi. south of Rush Creek	181,000
Mono—2.7 mi. grading and surfacing Mono Inn to 2.7 mi. south	63,500
Mono—3.5 mi. grading and surfacing Sherwin Hill to Whiskey Creek	35,000
Monterey—11.1 mi. grading and paving King City to Greenfield	369,000
Monterey—6.6 mi. grading, paving and bridges 6 mi. south of San Ardo to Bradley	339,500
Monterey—11.0 mi. grading and paving Chualar to 6 mi. south of Gonzales	361,000
Monterey—1.5 mi. grading, surfacing and bridge, Carmel to Carmel River	101,000
Monterey—4.7 mi. grading Big Sur to Molera Ranch	170,000
Monterey—0.1 mi. grading San Lorenzo Creek to Priest Valley School	150,000
Nevada—7.4 mi. surfacing 1 mi. W. Washington Road to ¼ mi. East of Summit	110,000
Nevada and Placer—11 mi. surfacing Yuba River to Soda Springs	25,000
Nevada—5 mi. grading and surfacing Hinton to 5 mi. easterly	100,000
Nevada—4.7 mi. grading and surfacing west end Donner Lake to Rt. 38	160,000
Orange—Grading and paving Santa Ana Canyon (portions)	200,000
Placer and Nevada—4.1 mi. grading and surfacing Spaulding Canal to Rt. 37	190,000

Prison Labor Camps

Riverside—12.5 mi. grading and surfacing Indio to 12.5 mi. easterly	300,000
Riverside—12 mi. oil surfacing near Shaver's Summit westerly	20,000
Riverside—19 mi. grading, surfacing and structures Beaumont to Riverside	601,800
Riverside—12.1 mi. repair dips Banning to Whitewater	70,000
Riverside—9.3 mi. grading and surfacing Black Butte to Blyth	52,000
Riverside—45 mi. surfacing shoulders South Boundary to Corona	45,000
Riverside—25 mi. surfacing shoulders Elsinore to Box Springs Grade	25,000
Riverside—14.3 mi. surfacing shoulders south boundary to Avenue 62	14,300
San Bernardino—Grading, paving and bridge San Timoteo Creek	38,000
San Bernardino—18 mi. grading and surfacing Camp Cajon to west boundary	240,000
San Bernardino—5.8 mi. grading and paving Sierra Ave. to Colton	200,000
San Bernardino—2.1 mi. grading and paving Ontario to Pomona	110,000
San Bernardino—1 mi. grading and surf. Fawnskin easterly	25,000
San Bernardino—1 mi. grading and surfacing San Bernardino to Arrowhead Springs	40,000
San Diego—16.4 mi. grading, paving and bridges Delmar to Oceanside	535,000
San Diego—18 mi. grading, paving and bridges Oceanside to San Mateo Creek	479,000
San Diego—10 mi. grading and paving Nat'l City to San Ysidro	285,000
San Diego—1.2 mi. grading and paving El Cajon easterly	28,000
San Francisco and Alameda—Grading and paving San Francisco Bay Ridge approaches	1,500,000
San Joaquin—3.5 mi. paving French Camp to McKinley Ave.	122,000
San Joaquin—4.4 mi. grading and paving Lodi to Waterloo Road	121,000
San Luis Obispo—2.1 mi. paving Pismo to San Luis Obispo (portions)	77,500
San Mateo—4.9 mi. grading and paving San Mateo to Redwood City	435,000
San Mateo—Grade separation, So. San Francisco	150,000
Santa Barbara—5.3 mi. grading and paving Arroyo Hondo to Gaviota	315,000
Santa Barbara—1.4 mi. grading and paving Tajiguas to Arroyo Quemado	60,000
Santa Barbara—3.7 mi. grading, paving and bridge Nojoqui Grade	479,000
Santa Barbara—1.5 mi. grading and paving Richfield Tower to Santa Maria	62,000
Santa Barbara—0.7 mi. grading and paving Santa Maria to Santa Maria River	27,000
Santa Barbara—1.6 mi. grading and paving Hollister Subway to Santa Barbara	113,800
Santa Barbara—1.9 mi. grading and paving Ortega Hill and San Ysidro Road to Santa Barbara	147,000
Santa Barbara—5.7 mi. grading and structures Santa Barbara to San Marcos Pass	500,000
Santa Cruz—6.7 mi. grading and surfacing Inspiration Point to Scott Valley	277,000
Santa Cruz—3.9 mi. grading and surfacing Scott Valley to 1 mi. north of Santa Cruz	300,000
Shasta—16.2 mi. surfacing Diddy Hill to Montgomery Creek	55,000
Siskiyou—0.8 mi. grading and surfacing Big Canyon	86,500
Solano—3.3 mi. grading, paving and bridges 5.5 mi. north of Fairfield to 1 mi. So. of Vacaville	172,000
Solano—11 mi. grading Benicia-Vallejo Road to Cordelio	400,000
Solano—1.5 mi. grading 1 mi. north Carquines Bridge to Vallejo-Benicia Road	59,000
Solano—0.7 mi. grading and surfacing at Fairfield	20,000
Sonoma—0.9 mi. grading and surfacing Foster Line Change	60,000
Sonoma and Mendocino—13.8 mi. grading, paving, bridge and grade separations Cloverdale to Hopland	652,500
Stanislaus—1.3 mi. grading and paving ¼ mi. south to ¾ mi. north of Turlock	65,000
Tehama—26.5 mi. grading and surface shoulders south boundary to Red Bluff	250,000
Tehama—13.8 mi. grading and surfacing Red Bluff to Dales	485,000
Trinity—10.3 mi. grading and surfacing South Fork to Burnt Ranch (portions)	123,500
Trinity—Grading over Oregon Mountain	100,000
Tulare—9.9 mi. grading, paving and bridges, Visalia to Merryman	340,000
Ventura—3.4 mi. grading and paving Stallo to Santa Clara River	72,000
Ventura—1.2 mi. grading and paving South Boundary to Newberry Park	40,000
Ventura—12 mi. grading and paving Ventura to W. Boundary	672,000
Ventura—1.2 mi. grading, paving and bridges east boundary to Little Sycamore Creek	35,000
Ventura—8.1 mi. grading, paving and bridge Oxnard to Callegnas Creek	166,000
Ventura—0.6 mi. grading, paving and bridge at Big Sycamore Creek	65,000
Ventura—Grading Casitas Pass Road (portions)	150,000
Yolo—3.5 mi. grading and paving Causeway to "M" St. Subway	122,000
Yolo—0.1 mi. grading and paving West approach to Causeway	6,000
Yuba—2.5 mi. grading, paving and bridges Wheatland to Morrison's Crossing	117,000

Bridge Construction

Bridge Construction during this same period involves 19 separate items and a total expenditure of $2,037,288.

Connecticut

The following statement shows the mileage of roads constructed during the year by the State Highway Department of Connecticut on the basis of an estimate prepared for us under date of December 28th by C. G. Nichols, Executive Deputy Commissioner.

	Trunk Line	State Aid	Town Aid
Graded	5.30	—	—
Loose gravel	—	—	131.37
Rolled Gravel	—	.55	78.76
Rolled gravel treated	—	—	40.47
Waterbound macadam	4.65	27.87	17.41
Bituminous macadam	.72	8.11	5.74
Reinforced concrete	32.59	.40	.31
	43.26	36.73	274.36

Total mileage of 354.25 includes 42.04 miles built under Federal Aid System.

It is still impossible to give definite figures for the 1933 program.

Georgia

Grading for new roads in this State during 1932 furnished the Tax Payers of Georgia with 358.687 miles of new highway at a cost of $2,490,835. Of this sum $357,855 came from Federal Aid; $473,295 came from Emergency Federal Relief funds; $1,656,817 from State Road funds; $2,323 from County Road funds and $545 from Local funds. Reconstruction on State roads on 65.63 miles cost $88,658. The grading of new roads required an excavation of approximately 4,000,000 yards while the reconstruction required 500,000 cubic yards of excavation. Carried over into 1933 on old contracts is about 500,000 cubic yards of excavation. The entire Federal Emergency Relief appropriation has been applied to 1932 construction. In addition Georgia paved 317.564 miles at a cost of $4,058,239 and graveled 154.682 miles at a cost of $926,805.

At this writing the amount of work to be released in 1933 is still very indefinite and it is impossible to make any forecast of value.

Illinois

There has been completed on the State Highway System during 1932 a total of 720.73 miles of pavement of which 1.53 miles is of gravel and macadam and the balance of concrete or other high type surface; 180.03 miles of grading and 166 bridges. Illinois is carrying over for construction during 1933, 723.06 miles of paving, 95.27 miles of grading and 103 bridges. The extent of additional work which may be placed under contract will depend upon the funds available. If there is no radical change in the revenues which become available and if there is no diversion of state highway funds, the Illinois Division of Highways, according to Ernst Lieberman, Chief Highway Engineer, expects to have about $31,000,000 for construction during 1933. This will permit the building of about a thousand

(Continued on page 90)

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miles of pavement together with an appreciable amount of grading and bridge work.

The various counties have completed during 1932, under State supervision, approximately 807 miles of surfacing, of which 512 miles were of gravel or macadam and the balance of higher type, 197 miles of grading and 172 bridges. They are carrying over, for construction during 1933, 225 miles of surfacing, 69 miles of grading and 92 bridges. Additional information on programs for the counties for 1933 is unavailable. Certain of the funds which have heretofore been used by the counties for highway work exclusively have already been diverted and authority has been given for additional diversions. While the county work will therefore show a decrease from 1932 it is not possible to estimate just how much this decrease will be or what the additional work may replace under contract will amount to.

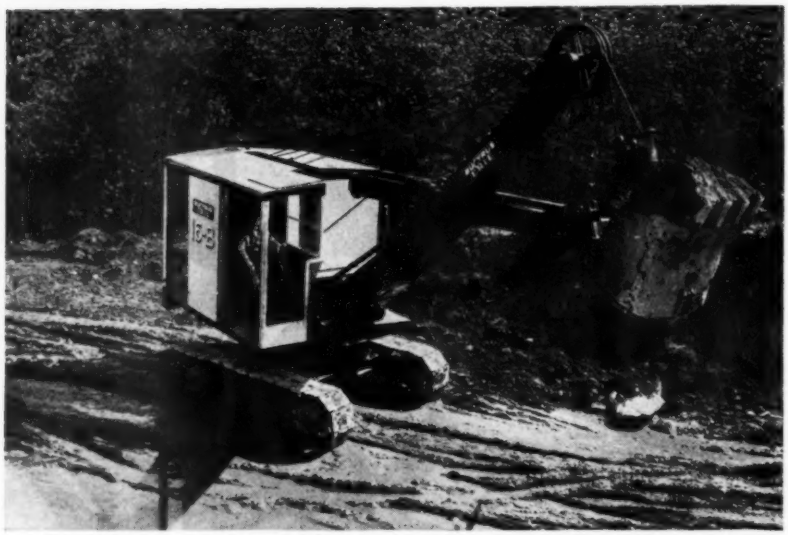
Indiana

During the fiscal year ending September, 1932 Indiana built 388 miles of high type pavement including a small percentage of more than two lanes in width. It also constructed 49 miles of heavy grading and drainage projects. In addition, later in November, Indiana let 95 miles of heavy grading totaling $2,500,000. It is expected that Indiana will be able to concrete approximately 150 miles more of high type paving through use of the Emergency Relief funds during the first half of 1933. Three interstate bridges were completed last year, two across the Wabash River opposite Vincennes and Mt. Carmel, Illinois and one across the Ohio River between Henderson, Kentucky and Evansville, Indiana. The estimated bridge program for 1933 at this time is approximately $2,000,000 or slightly less than the program for 1932.

Massachusetts

Summarizing the work completed during the year ending November 30, 1932 under the supervision of the Department of Public Works, Chief Engineer A. W. Dean, gives us the following data. New roads built totaled 116 miles and cost $8,300,000. 35 miles of this was built with a combination of Federal Aid and State funds at a total expenditure of $3,600,000. 34 miles was built with State funds and cost $3,400,000 while 47 miles were local roads costing $1,300,000. Reconstruction totaled 182 miles and cost $8,500,000. Of this 22 miles was Federal Aid and State roads costing $2,000,000; 50 miles was from State funds totaling $4,000,000 and local roads accounted for 110 miles costing $2,500,000. Excavation on the new roads for roadway totaled 1,500,000 cubic yards; ledge 100,000 cubic yards; bridge 50,000 cubic yards. The reconstruction required 2,000,000 cubic yards of roadway, 70,000 cubic yards of ledge and 6,000 cubic yards for bridges. About a million cubic yards of excavation to cost $250,000 was carried over into 1933 on old contracts. All Emergency Relief funds available have been utilized in projects already let in Massachusetts which include 181 miles of paving last year at a cost of $15,000,000 and applied crushed stone to 109 miles at a cost of about $2,000,000. The above data gives only the construction done under the supervision of the Department of Public Works and necessarily does not include all the road work that was done in Massachusetts during the past year, such as work in Metropolitan Boston and other municipalities. The costs given for the construction of new roads represent the whole cost of the road including drainage, structures, land takings and engineering costs. Work under the Federal Relief Act has all been let but no part of it has been completed up to November 30, 1932 so that no figures are available in respect to this particular construction.

It is very difficult to give any accurate forecast as to just what highway work will be let in Massachusetts during the coming year but it is estimated by the Excavating Engineer that Massachusetts will show a decrease of 30% in highway construction expenditures for 1933.



We can all of us remember when mud holes like this were a common occurrence even on our main trunk highways. There will not be any mud hole, however, when Arrigoni Brothers of Middletown, Connecticut finish with this road job near Barkhamsted, Connecticut. The shovel is one of those new snappy ½-yard Bucyrus-Erie 16-B's and it is just starting in here on a bank where the cut runs from 10 to 15 feet. In spite of its small size it is hard to keep trucks under the dipper as the operators say it is the fastest shovel to operate of any they have been on. Our reporter made a time study of the machine and found that the time of the digging cycle showed from 18 to 20 seconds when swinging a full 180 degrees.

Mississippi

The program of the State Highway Department of Mississippi depends entirely upon the Federal Aid appropriation and the possibility of selling the five million dollars in bonds authorized by the legislature in a special session in October, 1931 and which are as yet unsold. The next regular session of the legislature does not occur until January, 1934 and aside from the bonds there are no State funds available for construction. These could only be provided through a special session of the Mississippi State Legislature or sale of authorized bonds.

Nebraska

Nebraska operates on a pay as you go basis. The funds for highway construction, consisting of receipts from auto registration, gas tax, and Federal Aid appropriations, all depend at this writing on legislative action which it is impossible to forecast. The Department of Public Works has under construction or under contract for construction for the first of the year and to be completed during 1933, 95 miles of paving and grading, 22 miles of bituminous mat surfacing, 121 miles of gravel surfacing, 159 miles of grading, 95 bridges, 3 overpasses and 2 underpasses. At such time as all of this work is completed the status of the marked and maintained Highway System will total approximately 7,809 miles. This will include 710 miles of paved roads, 292 miles of bituminous mat roads, 5,763 miles of gravel roads and 1,044 miles of earth roads without surfacing.

New Mexico

In his annual message to the convening legislature the Governor of New Mexico recommended a highway debenture issue for 1933-34 of $2,000,000. It is impossible to predict at this time the outcome of this proposal. As reported in our January, 1933 forecast, New Mexico still has available $1,300,000 of her allotment from the Emergency Federal Relief appropriation.

New York

While the New York Legislature is now in session it has as yet made no appropriations for highway construc-

tion. It would appear from current gossip that the New York State Highway appropriation for 1933 will be very much reduced from that of last year.

Texas

The Texas Legislature which convened Tuesday, January 10th has already received several bills which would divert revenue now coming to the State Highway Department. Revenues from the gasoline tax have already been cut due to an act by a special session of the Legislature last year which set aside one cent of the gasoline tax as a special fund for the retirement of county and road bond indebtedness. With Federal Aid awaiting the action of the present Congress and State funds uncertain, it is impossible to make an accurate forecast of the work to be done in 1933 at the present time.

On December 31, 1932 there was under construction or under contract 2,594 miles of highway work, all of which is carried over into 1933.

Through the courtesy of Gibb Gilchrist, State Highway Engineer and E. J. Amey, Statistical Engineer, of the Texas State Highway Department, we present the accompanying summary of the projects that are carried over, the total cost amounting to $27,439,918.

Type—Carried-Over Texas Projects	Mileage	Cost*
Grading and Small Structures	1,110.49	$ 7,939,018.08
Gravel Surface	29.78	137,717.00
Caliche or Distintegrated Limestone	211.18	1,178,058.45
Macadam Surface (Including Crushed Rock or Stone)	189.54	1,219,909.15
Iron Ore Soil Surface	42.74	249,887.54
Single Bituminous Treatment on Caliche or Disintegrated Limestone	121.01	793,438.49
Single Bituminous Treatment on Iron Ore Soil	9.27	34,006.70
Single Bituminous Treatment on Gravel	13.06	115,172.80
Double or Triple Bituminous Treatment on Caliche or Disintegrated Limestone	125.30	761,460.89
Double or Triple Bituminous Treatment on Iron Ore Soil	15.64	148,938.42
Double or Triple Bituminous Treatment on Gravel	32.72	213,266.88
Double or Triple Bituminous Treatment on Macadam	82.66	768,427.36
Limestone Rock Asphalt on Macadam	18.63	212,874.43
Two Course Rock Asphalt on Gravel	9.18	66,166.86
Two Course Rock Asphalt on Macadam	.53	7,589.20
Two Course Rock Asphalt on Concrete	5.30	20,561.86
Asphaltic Concrete on Concrete	11.25	276,190.50
Concrete Pavement—Reinforced	562.63	10,839,577.30
Brick on Concrete	3.21	129,996.41
Bridges—Concrete	———	319,835.82
Bridges—Concrete and Timber	———	108,183.20
Bridges—Concrete and Steel	———	1,194,406.75
Bridges—Steel, Concrete and Timber	———	572,196.26
Underpasses—Concrete and Steel	———	61,987.31
Overpasses—Concrete and Steel	———	71,050.55

*Note: Cost based on estimated quantities at contract prices.

Utah

Based on the available unexpended balance of Federal Aid and Emergency Relief funds plus the estimated receipts of State Highway funds, Chief Engineer H. S. Kerr of the State Highway Department, expects to have approximately $3,200,000 available for 1933 work. Based on this figure approximately $2,000,000 will be expended for construction and reconstruction while $1,200,000 will have to go for maintenance. In addition it is estimated that county expenditures on road work will run approximately $1,000,000. Any further expenditures for construction depend upon additional Federal Aid appropriation. State work budgeted for 1933 includes 7.3 miles of paved roads estimated to cost approximately $220,000, 67.5 miles of gravel or crushed rock estimated to cost $115,000 and 7.3 miles of grading and graveling to cost $150,000. Bridges to cost $220,000 are scheduled. The remaining funds for construction are not budgeted because of the delay of Congress regarding Federal Aid.

Grading for new roads and reconstruction in this State for 1932 totaled 356 miles costing $2,639,000 on Federal Aid projects. State amounted to 146

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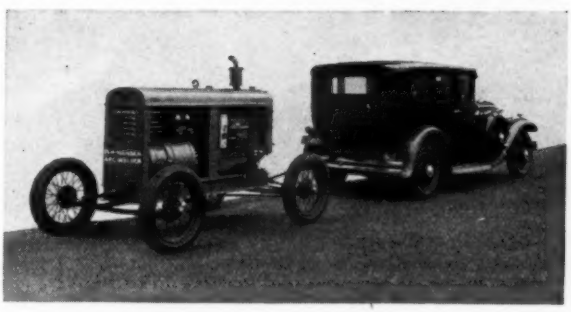

On most construction projects there are scores of places where electric welding is a cheap and effective way of getting ahead with the job. Excavating engineers can turn expenses into profits by handling their own welding with a low-cost, easy-to-operate P & H-Hansen Arc Welder. Compact and self-contained, thoroughly modernized in every part, a P & H-Hansen Arc Welder will make money for you on contract work and save money for you on maintenance of your equipment. Write today for full information.

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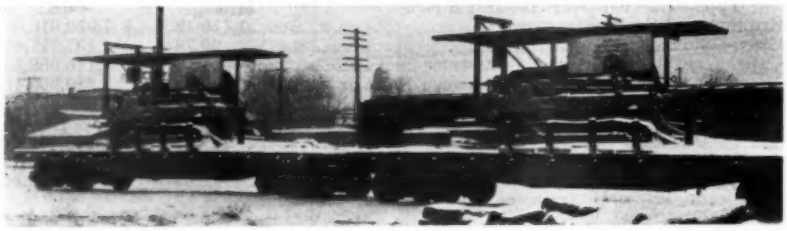

Modern drills for a modern quarry. These new Loomis Clippers, mounted on crawlers which will negotiate steep grades and have a turning radius of almost their own length, will cut drilling costs and help their new owner meet present day costs for highway surfacing and aggregates.

miles costing $476,000. It is probable that about $1,200,000 was expended on county roads. Excavation for this construction will run somewhere around 2,500,000 cubic yards. Approximately 600,000 cubic yards of excavation is carried over into 1933 on old contracts. Utah did not use all of her Emergency Federal Relief appropriation during 1932 and has $600,000 of this fund available for the first half of 1933. It is expected that this will probably be used for work involving about 200,000 cubic yards of excavation.

Following is a summary of approximate expenditures for 1932:

	Miles	Cost
Bridges (contracted separate from roadway)	——	$ 280,000
Concrete Pavement	15.9	421,000
Sheet Asphalt Resurface	2.4	30,000
Rock Asphalt on Crushed Rock base	2.9	29,000
Rock Asphalt Shoulders	9.0	28,000
Dust Oil Treatment Gravel Roads	58.6	8,000
Oil Mix Gravel Surface Treatment	240.2	546,000
Regravel Preparatory to Oil Treatment	138.3	299,000
Gravel Surfaced Roads	173.7	1,474,000
	641.0	$3,115,000
Regular Maintenance and Special Maintenance		$1,600,000

This interesting road building picture was taken recently on a piece of Missouri Highway being built by Perry McGlone of Clinton. A Bucyrus-Erie 37-B is loading from the borrow at the right and the Hug Road Builders climb up on to the grade and spread the dirt where needed. A team with a Morman levels up. In the distance a Caterpillar tractor with elevating grader loads some of the lighter grading to dump wagons behind the husky Missouri mules.

Washington

The 1933 program depends entirely upon the Legislature which is now in session and which at this writing has not prepared any road legislation. Through the courtesy of Samuel J. Humes, Director of Highways and Lawrence R. Turnbull, Office Engineer, we are able to present here, however, summaries of the work carried out during 1932.

The expenditures for the calendar year 1932 are as follows:

Construction	$7,964,040
Maintenance	1,573,026
Betterment and Reconstruction	1,841,425
Overhead	502,237
Capital Outlay	50,785

The expenditure of Federal funds is not worked up for the calendar year but the following is the expenditure of Federal funds for the fiscal year ending March 31, 1932.

Regular Federal Aid	$2,308,833
Emergency Construction funds	1,169,548

Trade Notes

Among the new dealers added lately to the **Caterpillar Tractor Company** organization are:

Western Motor, Lld., Brandon, Manitoba, Canada.
Stouffer Tr. and Eq. Co., Harrisburg, Pennsylvania.
Jack Neal Sales Co., San Antonio, Texas.
Syracuse Supply Co., Syracuse, New York.
Hunter Machinery Co., Milwaukee, and Madison, Wisconsin.
John East Iron Works, Ltd., Saskatoon, Sask., Canada.
The General Supply Co. of Canada Ltd., Toronto and Ottawa, Ontario, Canada.
Rio Grande Hardware & Machinery Co., Harlingen, Texas.
Bert Smith Road Machinery Co., Enid, Oklahoma.
Haight Tractor & Equipment Co., Des Moines, Iowa.
Georgalina Tractor Co., Augusta, Georgia.
Tractors & Equipment, Ltd., Fredericton, N. B., Canada.
Grand Forks Tractor & Equipment Co., Grand Forks, N. D.
Gleason Motor Car Co., Shamokin, Pennsylvania.
Smith Tractor & Equipment Co., Irvington, N. J.
Flowers Tractor & Equipment Co., Omaha, Neb.
Cliff Miller Tractor & Equipment Co., Council Bluffs, Iowa.
Spring Grove Tractor & Equipment Co., Cincinnati, Ohio.
Jarvis-Tull Tractor & Equipment Co., Plainview, Texas.
F. Rendon & Hermano, Nuevo Laredo, Tamps, Mexico.
Connelly Machinery Co., Billings, Montana.
Glendive Tractor & Equipment Co., Sidney and Miles City, Mont.
Quincy Tractor Co., Quincy, Illinois.
W. T. Walsh Equipment Co., Cleveland, Ohio.

The Columbus-McKinnon Chain Corporation announces the removal of their fire welding operations from Columbus, Ohio to Tonawanda, N. Y., affording users faster delivery and better service. Principal items of fire welded chain now manufactured in Tonawanda are: CC iron dredge chain, C C iron sling chain, Hercules steam shovel chain, stud link cable chain, C C steel loading chain, long link conveyor chain, and proof, BB and BBB coil chain in sizes ⅞" and larger.

F. L. Stone, general sales manager, and Paul C. Van Zandt, assistant to president in connection with operations and engineering, were elected vice-presidents at a meeting of the board of directors today of the **Universal Atlas Cement Company**, a subsidiary of the United States Steel Corporation.

The Keller Tractor & Equipment Company recently took over the old Contractors Equipment Company of Detroit and is now rounding out its lines of construction equipment to which was recently added Bucyrus-Erie shovels, draglines and cranes and Loadmaster, the handy, mobile crane that has shown such remarkable savings in material handling costs wherever installed.

In addition to the Bucyrus-Erie account it handles

"Caterpillar" Tractors and Road Machinery
Blaw-Knox Bins, Batchers, Forms, Truck Mixers, Buckets, Batch Boxes and Ord Finishing Machines
Gardner-Denver Air Compressors and Tools
Domestic Pumps and Hoists
Leschen Wire Rope
Huber Rollers
Etnyre Tar Distributors
Ateco Dirt Movers
Killefer Road Rippers and Scrapers
LaPlant-Choate Bulldozers, and Dump Wagons
Baker Maney Scrapers and Snow Plows

Mr. Keller entered the construction equipment business at Detroit in 1919 and organized the Contractors Equipment Company with offices at 305-309 Woodward Ave., later moved to 5163 Martin Ave., where larger quarters and better facilities were accorded. In 1928 the Keller Tractor & Shovel Company was organized with offices and warehouse at 5124 Braden Ave., to handle shovels, tractors and earth moving machinery only.

A short time later Mr. Keller disposed of his interests in Contractors Equipment Company.

The name was changed to Keller Tractor & Equipment Company last November and in April of this year it acquired the property and inventory of the Contractors Equipment Company and moved into the old quarters at 5163 Martin Ave.

Here is carried a large stock of repair parts and an excellent day and night service is maintained for the convenience of equipment owners.

The Nye Steam Pump and Machinery Company was recently moved to 621 South Kolmar Avenue, Chicago, Illinois. The business has been taken over by the same interests that control the **Hannifin Manufacturing Company**, manufacturers of air operated and hydraulic production equipment, and the **Sherman-Manson Manufacturing Company**, manufacturers of tubular steel products. All three companies are now located at the same address.

These activities are directed by Victor W. Peterson, who is President of all three companies. Mr. Peterson is also President of the Shafer Bearing Corporation, manufacturers of Roller Bearings for industrial and automotive applications.

The Nye Steam Pump, first introduced in 1869, is no doubt the oldest pump commonly known as the Pressure-Vacuum Pulsating type. This pump has been used by three generations of contractors in all kinds of construction work.

Easy Lifting— Handles up to 12,000 pounds

Handy Hoists take less time to get set for work (either hook may be fastened to the load), are light weight, and have no surplus chain to get snarled and kinked. A one man tool.

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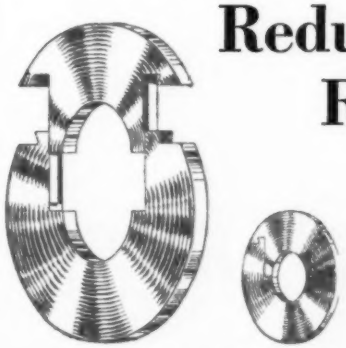

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When writing to Bucyrus-Erie Company, please use coupon or card bound in this issue.

Modern Methods Used in Old Dolomite Quarry

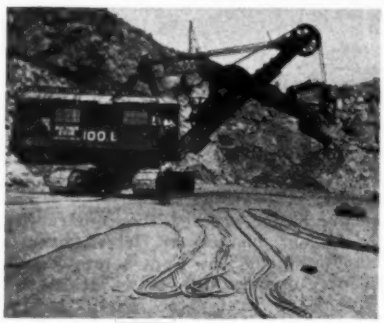
(Continued from page 71)

with 5-yard Phoenix side-dump bodies, made by Easton Car and Construction Co., Easton, Pa. The smoothness of the quarry floor makes high speeds possible, although the trucks—there are ten of them—usually carry at least 6 yards, weighing 7½ tons in the loose. Raymond Cheetham keeps an eye on all the trucks, as well as a pair of skillful hands, as a truck repair foreman should do. We are not surprised that here, at Clinton Point, just as at Haverstraw, the rock-hauling trucks carry no licenses. The three utility trucks are licensed, of course, but the 7½-ton AB Macks never leave company property, so why license them?

As they leave the primary crusher house, after dumping their loads, the trucks are routed to the shovels in need of them, when such routing is necessary, a number-signal system being used.

Quick Dumping of Trucks by Electricity

Full trucks, reaching the primary crusher house, pass both sides of the primary crusher. There are two dumping spots each side, so that rock slides down each of the four quadrants of the crusher hopper, equalizing wear on hopper, spider and crushing mechanism. Truck dumping at the primary crusher takes only a few seconds per truck, due to an ingenious, electrically operated device on each side of the hopper, which hooks into an eye at the side of the truck body and slides up an inclined, humped track, dumping the load.



Dragging its tail behind it, this 100-B shovel at the Clinton Point quarry moves to a new digging spot. For a while a single 3-conductor cable was used, but breakages caused so much trouble that now 3 single conductors and a ground are used, with very satisfactory results. Cables laid out in this manner are less likely to be run over; are kept track of easily; and are not so likely to pull apart when the shovel is moved.

We heard only one objection to the use of trucks, and that was voiced by one of the shovel operators who said he got a chance to take it easy once in a while in the old days when track had to be shifted, or cars would run off the track, but now "them dog-gone trucks is always comin' up to get a load." However, the fact remains that this quarry was operated successfully for many years with a track haulage system, and the Verplanck's Point limestone quarry, owned by the same corporation, is operating today with complete satisfaction using the Woodford Electric Haulage System.

100-B just ready to trip the dipper at Clinton Point Quarry of the New York Trap Rock Corporation. The length of pipe on the quarry face just above the dipper is part of the upper casing of a blast hole. Casing in the upper 15 feet is frequently required, due to broken rock conditions in upper strata.

Now that we've seen the quarry, let's walk back and look over the crushing plant. First, we come to the primary crusher, which is located on the quarry floor. It is a No. 21 Allis-Chalmers gyratory with 9-inch bottom opening, and will handle rock up to 38″x38″x40″. Leaving the primary crusher house, we walk back up through the sloping conveyor belt housing, across the railroad tracks and come again to the two 7-foot Symons cone reduction crushers. Rock from these crushers is conveyed by belt to sets of single and double-deck Gyrex scalping screens. Oversize material, rejected by the screens, is returned by belt conveyor to one of the Symons crushers for re-crushing, while material which passes through the scalping screens is conveyed by belt to the Gyrex and Vibrex sizing screens over the storage silos.

These silos, including the spaces between them, have a total storage capacity of 142,000 cubic yards, most of which can be fed by gravity into a belt conveyor

Here they are, all in a row; the trucks which haul the rock from the shovels to the primary crusher. Macks with Phoenix bodies to stand up under the battering of 7½-ton loads. All have solid single front and rear tires. Not one has a license.

which runs through a tunnel beneath the silos. This tunnel belt conveyor takes the sized stone to the stone washer, whence other belt conveyors take it to the steamship, scow, railroad car or truck loading points.

There are thirty or more belt conveyors of varying sizes in the mill, requiring a total of some 1,600 horsepower to operate. The crushers take 650 horsepower, and the screens 240 horsepower. All equipment in the mill is electrically operated, and a complete interlock and signal system is installed to prevent any piling up of material at any point in case some piece of apparatus should be stopped. L. F. Miller, electrical engineer for the New York Trap Rock Corporation, made the layout for and supervised the installation of all electrical equipment and wiring.

New York Trap Rock Corporation Rock Sand Popular

The mill was designed for an ultimate capacity of 1,200 tons an hour—the dolomite weighs 4,725 lbs. per cubic yard in the solid—but to handle this maximum 1,200 tons an hour, some additional crushing equipment would have to be installed. The present installation produces about 600 tons an hour.

Taking coal aboard one of the 50-B Bucyrus-Erie steam shovels at the Clinton Point plant of the New York Trap Rock Corporation. Note the Cyclone well drill on top of the quarry face, and the men with the Jackhamers blocking at the base of the cliff.

Rock sand has become an important product of the Clinton Point plant, and a laboratory control assures uniformity of the quality of material produced. Just prior to our arrival at the plant, a steamship left for Florida with a load of crushed stone and rock sand—that's almost as amazing as if someone were to ship a load of oranges there.

Note the extremely light color of this dolomite rock and the seamed and fissured condition of the quarry face. Rock comes down pretty well broken, though there are occasional pieces that require secondary blasting.

Shipments of stone and sand are by steamship, scow, truck or railroad car, although the great bulk of the materials produced is shipped by water to New York City and nearby points.

This story wouldn't be complete without a word of thanks to the personnel at the Clinton Point plant for their courtesy. Besides those already mentioned, we are indebted for various kindnesses to the following: William Morris, mill foreman; John Curran, master mechanic; Robert L. Reick, office manager; Clarence Stetser, chief electrician; Charles Buickerood, stockroom foreman; Frank Lahey, shipping clerk; and Charles LeRoy, timekeeper. The shovel operators are Frank Merritt, operator, and Martin Lynch, oiler on the 100-B; James McKee, Edward Damm and Richard Kelly, operators, and John Ewing, Kenneth Wheeler and Gregory Eagen, firemen on the 50-B's. George Allen operates the dragline.

Old Times & Old Timers

(Concluded from page 77)

Shovel-runners: Fred Sheasley, Eddie Rockett, Ed Brown, Art and Leo McDonald, Joe Bell, 'Race-Horse' McCarthy, George Rivers, 'Valve-Motion' George Baker, Eddie Stevenson, Charlie Cooper, Lew Hutchins, Bill Boothby, Charles Brogan, Charlie Dugan, Dick Harwell, Johnney Fisher, Tom McGovern, Tom Cunningham.

"Some Superintendents: Roderick McClure, M. J. Coffee, Dennis Madden, F. C. Hitchcock, Ed Lewis, George Reeves, 'Mushhead' Kennedy, Dick McGoegan.

"And lest we forget—a few we knew who have passed on: J. J. Cunningham, Martin Kain, Frank Huff, Dilly Bell, 'Jap' Pearse and Leo Emery."

Thanks to you, Old Timer McMenamin, and who takes our money next month?

We will pay for all published letters. They should not be more than 500 words. Write in your own words the most interesting experience in your excavating experience. We want facts and facts only. The events must have occurred at least fifteen years ago. If possible send pictures along with your letter . . . pictures of old timers connected with your story and the machines they worked on . . . the older and odder the better. Any pictures submitted will be returned promptly . . . please wrap and protect with cardboard when you send them to us, however, as we cannot be responsible for damage in the mail.

Let's hear from more of our Old Timers!

Book Reviews

The Decline of the Bituminous Coal Industry in Pennsylvania, an interesting pamphlet analyzing what is happening in the Pennsylvania District has been recently issued by the Commonwealth of Pennsylvania, Greater Pennsylvania Council, as Soft Coal Bulletin No. 1. If you would like a copy write to the **Mellen Institute of Industrial Research,** Thackeray Avenue and O'Hara Street, Pittsburgh, Pennsylvania.

Conveyor belt problems in many industries, advantages of the belt conveyor, details of belt construction and suggested applications are discussed in **"How Shall We Handle It",** a recent publication of the **Diamond Rubber Company, Inc.,** Akron, Ohio.

Profusely illustrated with pictures showing conveyor belts in action under widely divergent conditions, the booklet shows how the question of economical handling of many types of materials has been answered by a large number of plants.

Specific plant problems, adaptability and versatility of the belt conveyor, and use of conveyor belts in the cement industry, metal mining and refining, brick and clay plants, sand, gravel and crushed rock operations, construction work, food and canning industries, coal docks, grain industry, and a wide variety of other applications are decribed with a wealth of pictures.

Copies may be obtained on request to the manufacturer.

Dredging, treatment, and storage methods used and costs obtained by the Seaboard Sand and Gravel Corporation are described and tabulated by Anderson Dana, vice-president of the Corporation, in Information Circular 6592, published by the United States Bureau of Mines. This material may be obtained free upon request to the **United States Bureau of Mines, Washington, D. C.**

"Rock Drills and Sharpeners" is the title of a 32-page illustrated condensed catalogue which consolidates in one volume essential information concerning Ingersoll-Rand equipment for drilling rock and for reconditioning drill steels. In addition to describing the various rock drills, including "Calyx" core drills, the booklet covers all accessory equipment and also contains instructions for correctly heat treating drill steels. Copies of the catalogue, Form 4101, may be obtained from the general offices of **Ingersoll-Rand Company,** 11 Broadway, New York, or from any of the company's branch offices.

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CONSTRUCTION SUPERINTENDENT

I have 20 years' experience as shovel operator, master mechanic, erector of construction machinery and highway foreman. Willing to accept position with any construction company. Can furnish the best of references. Address Box 5103.

DRAGLINE-CLAMSHELL-SHOVEL OPERATOR

Have 20 years' railroad, quarry, drainage, levee and highway experience operating Bucyrus-Erie and Northwest shovels and draglines, gasoline, steam, Diesel and electric machines. Willing to go anywhere on any machine. Can furnish good references and do own repair work. Married. Present location, Indiana. Box 4101.

MINING ENGINEER

Mining Engineer, 34, married, fluent Spanish, desires position with responsible company. Experience — two years assistant engineer gold mine; three years foreman in large underground copper mine; six years foreman to mine superintendent open pit operating 25 electric shovels and draglines. Available immediately. Location, Maryland. Box 3801.

CONSTRUCTION AND MAINTENANCE ENGINEER

Over 25 years' experience on all types of shovel, cranes, locomotives on general construction work. Capable of taking full charge of crew. At present located in Australia. Available for work in New Zealand, China or Federated Malay States. Can furnish excellent recommendations. Address replies to W. J. A., 22 Ruthven Street, Waverly, N.S. Wales, Australia.

ENGINEER-SUPERINTENDENT WANTS CONNECTION WITH CONTRACTOR

Twenty years' exceptional experience in factory construction, rock work, roads, dams, tunnels, hydro-electric developments, foundations. Has produced results under difficult conditions and can handle large program in whole or part. Eight years Latin America. Go anywhere. Box 5102.

DRAGLINE—CLAMSHELL—SHOVEL OPERATOR

Have operated gasoline, electric and steam machines for past 15 years. Willing to go anywhere. Married, 36 years old. Best of references. Can do own repairing. Present location Minnesota. Box 3901.

SHOVEL OPERATOR

15 years' experience on electric, Gas+Air and steam machines on basement excavating; highway and railroad grading. Will go anywhere in U.S.A. Married. Age 35. A-1 references. Can do own repairing. Present location Pennsylvania. Box 3504.

DRAGLINE-CLAMSHELL-SHOVEL OPERATOR

18 years' all around experience on highway, drainage and mine work. Will go anywhere. Can do own repair work. Reliable references. Present location, Florida. Box 3802.

SHOVEL OPERATOR

Have 14 years' experience on Gas+Air, straight gas and steam shovels. Willing to go anywhere in U.S.A. Married. Best of references. Can do own repair work. Present location, Minnesota. Box 3902.

SHOVEL OPERATOR

33 years' experience on full revolving shovel and railroad type shovels on all kinds of highway, grading, coal stripping and construction work. Familiar with both small and large machines. Can do my own repairing and furnish class A references. Willing to go anywhere. Present location, Pennsylvania. Box 5201.

DRAGLINE-CRANE-SHOVEL OPERATOR

Have had 15 years' experience on Diesel, electric and steam machines on levee and stripping operations. Will go anywhere. Married. A-1 references furnished. Can handle own repair work. Present location, Illinois. Box 3803.

FOREMAN—ESTIMATOR—ENGINEER

15 years' experience construction field as above. Age 34, married, war veteran, not afraid of hard work. Graduate University of Wisconsin College of Engineering. Will go anywhere. Excellent references. Available September 1st. Location, Illinois. Box 3703.

TRANSITMAN — OFFICE WORK

Experienced transitman with mining experience desires transit work, or will work as rodman, chainman or engineer's helper. Have also had experience as timekeeper, and much experience in safety work. Good references. Located Wisconsin, will go anywhere. Box 3513.

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Small Shovels
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BUCYRUS-ERIE EXTRA HIGH LIFT TYPE B-2 steam shovel, 21-foot 3-inch boom, 16-foot dipper handle, one-yard inserted tooth dipper, single shaft "cat". Excellent condition. Will sell or rent. Box 384-SS.

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OSGOOD GASOLINE ONE-CUBIC-YARD COMBINATION SHOVEL-CLAMSHELL-DRAGLINE. Six cylinder Beaver motor. Overhauled late 1931. Bargain price. Box 323-SS.

Two 20-B Bucyrus steam shovels. Located Aurora, Illinois. Price each $1500.

30-B Bucyrus steam shovel. Located Charleston, Mississippi. Price $1500. Box 303-SS.

FOR SALE

Address all box numbers c/o Excavating Engineer at South Milwaukee, Wisconsin

Small Shovels
Under 2 Yards
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LINK-BELT GAS SHOVEL, one-yard dipper, 22-foot boom, 16-foot dipper handle, Waukesha JL 6"x7" motor. Good operating condition. Box 377-SS.

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TYPE B-2 BUCYRUS-ERIE STEAM SHOVEL, number 9830, mounted on single shaft caterpillar type mounting. Equipped with 21-foot 3-inch boom, 16-foot dipper handle, ⅞-cubic-yard inserted tooth dipper. Boom hoist and Mass. standard boiler. Located vicinity of Boston. Reasonably priced. Box 345-SS.

BUCYRUS-ERIE brand new 1035 gasoline shovel, rope chain crowd. Also clamshell or dragline equipment. At price you cannot refuse to consider. Box 356-SS.

BUCYRUS-ERIE GAS+AIR Combination high lift shovel and dragline equipment. Chain drive. "Cats." Very good condition. Located vicinity Chicago. Box 337-SS.

P&H MODEL 600—1-yard Gasoline Shovel. Three years old. Excellent condition throughout. Just been thoroughly overhauled. Will sacrifice at bargain to responsible buyer. Located in Wisconsin. Box 368-SS.

BUCYRUS-ERIE B-2 HIGH LIFT STEAM SHOVEL, 19-foot 9-inch boom, 16-foot dipper handle, one-yard inserted tooth dipper. Good operating condition. Price this machine could be earned and paid as rent within a few months. Box 383-SS.

USED P&H MODEL 700 gasoline, combination shovel-dragline, shop number 3007, including 1¼-cubic-yard drag scraper bucket. Dragline boom 40-foot plus 10-foot extension, shovel boom 25-foot 10-inches, dipper handle 19-foot 3-inches, dipper 1¼-cubic-yard. Engine Waukesha Type WL 4 cylinder 6¼"x7". Good condition. Some repair parts on hand. Machine located Tilleda, Wisconsin. Box 378-SS.

NORTHWEST SHOVEL, model 105, caterpillar mounted, 24-foot boom, 1-cubic-yard dipper, 16-foot dipper handle. In good condition. Price $4,500, f. o. b. Utica, New York. Box 34-SS.

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UNIT MODEL B three-quarter swing, ¾-cubic-yard Shovel. New 1928. Excellent Condition. Box 350-SS.

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USED BUCYRUS-ERIE 30-B DIESEL SHOVEL—25'9" Boom, 14' Dipper Handle, Box 251-SS.

For Sale or Rent

MODEL 7 NORTHWEST dragline, equipped with Kohler lighting plant, 65-foot boom, 1½-yard bucket. Koehring shovel, Model 301. Address replies to Box 361-SS.

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TYPE B BUCYRUS-ERIE COMBINATION HIGH LIFT STEAM SHOVEL, 19-foot 8-inch boom, 16-foot dipper handle, ¾-cubic yard dipper, power boom hoist and 36-foot boom clamshell equipment complete. Located central Indiana. Price as is, f.o.b. present location $2,000. Box 311-SS.

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ORTON SHOVEL, new 1928. 16-foot 4-inch boom, 12-foot dipper handle. ⅝-cubic-yard dipper. Box 100-SS.

INSLEY ½-CUBIC-YARD SHOVEL, full-revolving. Shop number about R-200 (2 years old). Machine in excellent condition. Has had best of care. Located in Wisconsin. Box 238-SS.

20-B BUCYRUS-ERIE STEAM SHOVEL, serial number 4000; caterpillar mounted; 18-foot boom, 12-foot 6-inch dipper handle, 1-yard dipper; shipped new in 1923; located western Missouri. Bargain. Box 241-SS.

BUCYRUS-ERIE SLIGHTLY USED 1035 gas friction shovel, factory inspected, new machine guarantee. Rope Crowd, 23-foot boom, 15-foot dipper handle, ⅞-yard dipper, including Kohler light plant installed. Exceptional bargain. Box 382-SS.

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Please send me full details on:

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FOR SALE

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P&H MODEL 204. Shop number above 2200 combination Shovel Clamshell. 19' shovel boom, 14' 6" dipper handles, ½ cubic yard dipper, 35' clamshell boom, ½ cubic yard Owens Type M digger type bucket. Both front end equipments less than one year old. Excellent condition. Box 254-SS.

BARGAIN

Bucyrus-Erie Type B number 1982, ¾-yard steam shovel on caterpillar mounting with dragline attachment. Ideal for Construction work or Placer mining. Good condition, located Colorado Springs, Colo. Price right. Box 362-SS.

LORAIN 55 Gasoline one cu-yd. Shovel, new April 1929. Excellent condition. Box 270-SS.

THREE TYPE A BUCYRUS-ERIE STEAM SHOVELS. Good value. $500 each.

FOUR TYPE B BUCYRUS-ERIE STEAM SHOVELS. Good operating condition. $1000 each. Box 328-SS.

BRAND NEW PAGE DRAG SHOVEL EQUIPMENT suitable for application to Bucyrus-Erie 1030, 1035, or 32-B machines now in the field, consisting of 17-foot 1½-inch boom, 11-foot dipper handle, and two ¾-cubic-yard dippers: one 38-inches wide over cutters—the other 49½-inches wide over cutters, together with auxiliary A frame and ropes. Priced below cost. Box 381-SS.

P. & H. MODEL 206 Gasoline Combination Shovel and Clamshell machine. Good condition. Located vicinity Chicago. Box 336-SS.

THEW "O" ¾-cubic-yard gas shovel rebuilt 1931 and mounted on new center drive "cat". Box 343-SS.

AMERICAN 1-CUBIC-YARD GASOLINE SHOVEL. Motor overhauled 1932. Excellent condition. Will rent. Box 357-SS.

Small Draglines
Under 2 Yards

BUCYRUS-ERIE D-2 DIESEL one-cubic-yard shovel. Also 40-foot boom dragline equipment. Reconditioned and carries new machine guarantee. Box 284-SD.

BUCYRUS-ERIE GAS+AIR combination high lift dragline and shovel. Chain drive. "Cats." Excellent condition. Located vicinity Chicago. Box 337-SD.

BUCYRUS-ERIE E-2 DIESEL DRAGLINE, caterpillar mounted, 50-foot boom, 1¼-cubic-yard Omaha bucket, Kohler lighting plant. Machine was new in July 1930 and has been used less than 6 months. 243-SD.

P&H MODEL 700 USED GASOLINE COMBINATION DRAGLINE-SHOVEL, shop number 3007, 40-foot dragline boom plus 10-foot extension and 1¼-cubic-yard drag scraper bucket. 25-foot 10-inch shovel boom, 19-foot 3-inch handle and 1¼-cubic-yard dipper. Waukesha Type WL 4 cylinder 6¼"x8" engine. Good condition. Some repair parts on hand. Machine located Tilleda, Wisconsin. Box 378-SD.

MONIGHAN DRAGLINE, 60-foot boom, mounted on 1-W walker and 1¼-cubic-yard Page bucket. Good condition. Price right. Box 339-SD.

BUCYRUS-ERIE TYPE D-2 DIESEL DRAGLINE, shop number 5055, 45-foot boom and 1 cubic-yard Page Class "M" drag bucket. Located Eastern Missouri. Priced to sell. Box 166-SD.

30-B BUCYRUS-ERIE DIESEL DRAGLINE with 40-foot boom and 1-cubic-yard bucket located in Alabama. Box 91-SD.

P & H MODEL 700 DRAGLINE; number 2894 equipped with a 50-foot boom, light 1½-cubic-yard drag bucket, electric light plant, and powered with 4-cylinder Atlas Diesel engine. About 3 years old. Box 189-SD.

OSGOOD ONE-YARD gasoline combination Dragline-Shovel-Clamshell. Overhauled late in 1931. Six cylinder Beaver motor. Bargain price. Box 323-SD.

KOEHRING MODEL 1 GAS DRAGLINE 40-foot boom and Page M ¾-cubic-yard bucket. Good operating condition. Box 374-SD.

FOR SALE OR RENT

One practically new Bucyrus-Erie Model E-2 Dragline, Diesel driven, equipped with 50' boom and 1½-yard Omaha dragline bucket, now located at Shenandoah, Iowa. Box 244-SD.

P & H DRAGLINE MODEL 700; number 2456 equipped with a 50-foot boom, light 1½-cubic-yard drag bucket, electric light plant, and powered with a Waukesha gasoline engine. About 2½ years old. Box 190-SD.

BUCYRUS-ERIE SLIGHTLY USED 32-B Gasoline 45-ft. boom dragline and 1-yd. Page bucket. Like new. Box 352-SD.

Small Clamshells and Cranes
Under 2 Yards

BUCKEYE CLAMSHELL-CRANE, gasoline driven, caterpillar mounted, equipped with 30-foot boom, ¾-cubic-yard clamshell bucket, fairleads and backfiller scraper. Located in Milwaukee, Wisconsin. Box 371-SCC.

GENERAL 35-FOOT BOOM CLAMSHELL MACHINE and ½-cubic-yard Lakewood bucket. Equipped with four cylinder Buda gasoline engine. Machine new September 1929. Box 335-SCC.

NORTHWEST MODEL 104, combination 45-foot boom clamshell and dragline. Will handle 1¼ cubic-yard bucket. Also 1¼ cubic-yard Full shovel attachment. Shop number around 1800. Good condition. Will demonstrate. Priced to sell. Box 297-SCC.

OSGOOD ONE-YARD GASOLINE combination clamshell-dragline-shovel. Equipped with six cylinder Beaver motor. Overhauled late 1931. Attractively priced. Box 323-SCC.

LITTLE GIANT CRANE—Gas—Caterpillar Model C. Type B—¾-yd. bucket. Recently overhauled. Now working. $1,500.

BROWNHOIST CRANE — Gas — Cats. Model 2-C Serial No. 8829. 1-yd. bucket. Good working condition. $1,500.

McMYLER MODEL J. LOCOMOTIVE CRANE—35 Ton Steam. 50 and 75-ft. Boom. 1½ or 2-yd. buckets. New boiler and swinging engine recently installed. A real crane for long reach and heavy work. Thoroughly overhauled condition. $4,500.

Box 346-SCC.

P. & H. MODEL 206 combination clamshell and shovel. Located near Chicago. Good condition. Box 336-SCC.

Large Shovels and Draglines
2 Yards and Over

BUCYRUS-ERIE 50-B STEAM SHOVEL, number 4751. Equipped with 1¾-cubic-yard bucket. Shipped new August, 1926. Priced to sell. Located in East, Box 366-LSD.

Monighan Track Type Dragline; 72-foot boom, 2½-cubic-yard Omaha bucket; Almost new Page Diesel engine; Machine now working northern Illinois. Priced to sell. Box 305-LSD.

50-B STEAM SHOVEL, new March 1927. Shop number about 4950. Has 26-foot boom, 17-foot dipper handle and 2-cubic-yard dipper. Priced to sell. Box 240-LSD.

If You Do Not Find What You Want Listed—Write Us

Excavating Engineer

South Milwaukee, Wis.

BUCYRUS-ERIE SHOP REBUILT 100-B STEAM SHOVEL; shop number 4890; 29-foot 6-in. boom; 20-foot handle; three-cubic-yard dipper. Can be inspected at So. Milwaukee, Wis. Priced to sell. Box 187-LSD.

For Sale or Rent

ONE CLASS-14 STEAM DRAGLINE excavator Number 3327 60-foot boom, 2-cubic-yard bucket, caterpillar mounted, equipped for burning gas or oil. Price very reasonable. Located at Turkey Creek, La. Box 111-LSD.

175-B STEAM SHOVEL No. 4090, equipped with 75-foot boom, 48-foot dipper handle and 3½-cubic-yard dipper. Machine is in very good condition. Oversize boiler. Box 148-LSD.

2½-YD. DRAGLINE

Class 220 Page Dragline; 100 H.P. Charter-Horizontal Twin Cylinder engine; 72-foot boom; 2½-cubic-yard Page bucket. Located Northwestern Indiana. Box 200-LSD.

85-C STEAM SHOVEL, on caterpillar mounting, caterpillars in good condition, price $2,500. Located near Hazelton, Pa. Box 163-LSD.

For Sale or Rent

ONE CLASS-14 STEAM DRAGLINE excavator. Number 3402, 70-foot boom, 2-cubic-yard bucket, caterpillar mounted, equipped for burning gas or oil. Priced very reasonable. Located at Grand Prairie, Texas. Box 110-LSD.

68-C BUCYRUS ELECTRICALLY OPERATED SHOVEL, equipped with 2½-yard manganese front dipper, 3 phase, 60-cycle, 440-volt motors, transformers, cable reel and approximately 1400 feet of cable, all in excellent condition. Reasonable price. Address Box 268-LSD.

6-YD. SHOVEL

BUCYRUS-ERIE 320-B electric shovel, Ward-Leonard control, 3 phase, 60 cycle, 2300 volts, equipped with 6-cubic-yard dipper, 85-foot boom and 58-foot handles. Is in good condition and may be inspected in operation. Reasonably priced. Box 279-LSD.

FOR SALE

Address all box numbers c/o Excavating Engineer at South Milwaukee, Wisconsin

Large Shovels and Draglines
2 Yards and Over
Continued

70-TON STEAM SHOVEL mounted on "cats," caterpillars in good condition. Located near Hazelton, Pa. Box 162-LSD.

DIESEL-ELECTRIC DRAGLINE

Class 14 Diesel electric dragline, Shop Number 5079, new fall of 1927 with 70-foot boom, 2-cubic-yard bucket, and with extra 10-foot extension, western location. Box 296-LSD.

70-C BUCYRUS STEAM SHOVEL on Cats. Complete. In operating condition. Shop number 1712. Also one extra three-yard Manganese dipper. Chicago territory. Box 347-LSD.

BUCYRUS 320-B STEAM STRIPPING SHOVEL, shop number 4205, new in 1925, used less than four years. Located at Toronto, Ohio. Box 74-LSD.

MONIGHAN DRAGLINE MODEL T, 2-cubic-yard 60-foot boom located near Wichita, Kansas, where it is now working. About seven years old. Has recently been thoroughly overhauled. Box 180-LSD.

70-C BUCYRUS, 2½ or 3-yard dipper, on caterpillars. Steam. Box 183-LSD.

BUCYRUS 70-C, Shop number around 1500. Thoroughly overhauled. Good working condition. Eastern location. Box 299-LSD.

50-B STEAM SHOVEL, Number 3946; equipped with 1½-cubic-yard dipper, 26-foot boom, also 1½-cubic-yard dragline bucket with 50-foot boom caterpillar mounted, equipped for burning oil, located at Texarkana, Ark. Price very reasonable. Box 112-LSD.

If You Do Not Find What You Want Listed—Write Us

Excavating Engineer

South Milwaukee Wisconsin

What Do You Bid On a

70-C STEAM SHOVEL located near Marietta, South Carolina, where it completed a railroad job? Bargain as supplementary shovel or as supply of spare parts.

88-C STEAM SHOVEL located in Kansas. Carefully laid up after completing season's work. 3½-yard dipper. Fine condition. Any reasonable offer accepted. Box 52-LSD.

BUCYRUS 80-B STEAM SHOVEL, shop number about 3800; 2-cubic-yard dipper; 48-foot boom; 32-foot dipper handle. "Cat" mounted. Priced to sell. F.o.b. cars. Box 255-LSD.

TYPE 175-B ELECTRIC, No. 794 equipped with 87' shovel boom, 48' dipper handle, 3½-yd. bucket, and dragline equipment including 125' boom, and 3½-yd. bucket. This machine was recently reconditioned and is in good operating condition. Present location, Connecticut. Box 263-LSD.

CLASS-24 BUCYRUS-ERIE STEAM DRAGLINE, shop number 912; 115-foot boom, 3½-cubic-yard Page bucket. Florida location. Box 73-LSD.

SHOVEL FRONT END for 175-B Bucyrus-Erie 65-foot boom, 47-foot dipper sticks and 3½-cubic-yard dipper. Located in Ohio. Box 10-LSD.

50-B BUCYRUS-ERIE ELECTRIC SHOVEL, equipped with 3-phase A. C. current, 550 volts, 60 cycle and has three motors. New Manganese steel dipper. Located South Carolina. Box 226-LSD.

3-YD. SHOVEL

BUCYRUS 78-C, caterpillar mounted; three-cubic-yard dipper; shop number 3611. Boom rebuilt last year. Equipped with new 103-C boiler and will pass boiler inspection in any state. Shovel is in very good condition and is in operation at present time. Box 326-LSD.

225-B OWNERS

You may be interested in a partial Bucyrus-Erie 225-B steam shovel located in Kentucky coal fields as a source of spare parts. No reasonable offer refused. Box 211-LSD.

MONIGHAN STEAM DRAGLINE, with 125-foot boom, 3½-cubic-yard bucket, mounted on skids and rollers, located southeastern Iowa. Box 367-LSD.

50-B DIESEL DRAGLINE; equipped with 50-foot boom, electric light plant, mounted on "cats." Located Vincennes, Indiana. Can be seen at any time. New August 1927. Box 78-LSD.

Miscellaneous Equipment

KIESSLER CLAMSHELL BUCKET, One 1½-cubic-yard; used only 90 days. Price $275.00. Box 298-ME.

For Sale or Rent

Two 40-ton, 6-wheel switchers. Recently overhauled and rebuilt. Two 50-ton, 6-wheel switchers. In excellent condition. Location Chicago. Box 306-ME.

4 LA PLANT-CHOATE, 6-yard, all-steel, dump wagons. Equipped with wide iron wheels. Price $200.00 each. Chicago territory. Box 349-ME.

DUMP CARS

6— 8-yard Western — 36-inch Gauge — 2-way side.

LOCOMOTIVES

1—15-ton, 10x14 — 36-inch Gauge — Vulcan Saddle Tank.
2—21-ton, 11x16 — 36-inch Gauge — Vulcan Saddle Tank.

BOILERS

1—100 h.p. Locomotive Type for 70-C Bucyrus shovel.
1—32 h.p. Locomotive Type Stationary.

Box 181-ME

40-FOOT BOOM CLAMSHELL EQUIPMENT COMPLETE, including ¾-yard Blaw Knox rehandling Bucket, suitable for application to Type B or Type B-2 Erie steam shovel. Equipment used only one season. Located central Indiana. Box 327-ME.

1—REBUILT SPUR GEAR CAT. MOUNTING, suitable for application Type B or B-2 Machines. Factory guarantee.

3—LOCOMOTIVE BOILERS 44"x17' 75 H. P. Under forced draft. 125 pounds working pressure, 393 sq. ft. heating surface. Heavily built for Railroad Shovel service.

1—PAGE "C" 1-CUBIC-YARD DRAGLINE BUCKET.

Box 332-ME.

LOOK AT THESE OFFERS

2—MOTORS, type KTR-3958, 8 pole, 21.5 HP, 900 RPM. Form GA- 440 V., 3 phase, 60 cycle, 160 amp. maximum torque 350' lbs. (5 min. 55°C) totally enclosed ball bearing, Model Number 74A157.

1—REBUILT KOHLER LIGHT PLANT 1½ K.W.

2—BLOWERS, Type CW, top horizontal discharge No. 75, Design No. 2, silent vane fan for continuous service, delivery to 7500 RPM direct connected to motor KT-946, 5-HP., 440 Volts, 3 phase, 60 cycle.

1—MOTOR, Type KTP-553-Y, 2 pole, 90 HP. 1500 RPM. Form E, 550 Volts, 3 phase, 25 cycles, 87 amp. speed full load 1440, Model No. 120312, serial No. 4523903.

2—11"x11"x12" WESTINGHOUSE AIR COMPRESSORS.

1—MOON 1 KW TURBO GENERATOR LIGHTING PLANT.

1—50KW MOTOR GENERATOR SET. Induction Motor, Model No. 10059, type KT 347-6-75-1200. Form B, 3 phase, 60 cycles, 440 volts, 93.5 amps. speed full load 1170 RPM. No. 4405940, 75 HP. Continuous, connected to:

GENERATOR—Serial No. 1359597, Compound wound, Form A, Type RC-35, Amps. 200, volts no load 250, speed 1200 RPM. Volts full load 250, 50KW Continuous. Mounted on Sub Base. With suitable rheostat and compensator.

1—GENERATOR Westinghouse 125 KW-250 Volts—500 Amperes, 440 RPM. DC-Generator, Serial No. 4,992,129 with two outboard bearings.

Box 372—ME

SMITH 27-E PAVER, gasoline driven caterpillar mounted, bought new late in 1930. Has handled less than 40,000 yards of paving. Priced to sell. Located in Arkansas. Box 312-ME.

BUCYRUS-ERIE TYPE B 40-foot clamshell attachment. Will consider any reasonable offer. Box 242-ME.

EVERY ONE A BARGAIN

1—STEAM ENGINE—12½"x16" link reverse for Railroad Shovel.

1—"LITTLE TUGGER" STEAM HOIST ENGINE No. 1-H5—2½ H. P. (Ingersoll Rand—Form 4333 Page 15).

17—BRAND NEW 75 H.P. 7"x8½" STROKE. 4 CYLINDER ATLAS DIESEL ENGINES. Non-reversible. Complete with auxiliary air compressor and fuel tank. Will sell without auxiliary compressor and fuel tank.

1—USED 45 H.P. 6½"x8½" NON-REVERSIBLE ATLAS DIESEL ENGINE.

3—4½"x5" REVERSIBLE STEAM ENGINES—20.8 H.P. at 400 RPM. Normal running speed at 100 pound steam pressure.

1—4¾"x5" REVERSIBLE STEAM ENGINE—23.2 H. P. at 400 RPM Normal running speed at 100 pound steam pressure.

2—5"x5" REVERSIBLE STEAM ENGINES—25.6 H. P. at 400 RPM. Normal running speed at 100 pound steam pressure.

ADDRESS BOX 375-ME

FOR SALE

Address all box numbers c/o Excavating Engineer at South Milwaukee, Wisconsin

Miscellaneous Equipment
Continued

WANTED

Used electric welding outfit, 200 ampere capacity. Must be in good condition. Address Box 379-ME.

LOCOMOTIVES

8 BALDWIN, 17x24, straight drive standard gauge 45 ton locomotives. 54 inch boilers. Shop numbers from 32,750 to 34,611. Each one has passed State Boiler Inspection yearly. Boilers will stand cold water test of 240 lbs. At present in actual service in Minnesota mine.

2 BALDWIN Locomotives, 19x26, standard gauge, 6 wheel switching type, shop numbers 39534 and 39536. Box 152-ME.

COMPLETE EQUIPMENT for 2 strip mines, contractors or quarry operations, No. 300 and No. 36 Marion steam shovels, well drills, locomotives, cars, crushers, picking tables, loading booms, cable and button retarders, compressors, motors, transformers, flood and search lights, camp equipment and new repair parts for above. Box 195-ME.

ARE YOU INTERESTED?

We desire to contract with reliable stripping contractor equipped to remove overburden composed of dirt, shale and sand rock to a depth of forty-five feet. Address Box 380-ME.

TWO 60 CATERPILLAR TRACTORS. Entirely rebuilt and in excellent condition. Located Chicago district. Priced right for quick sale. See them at once. Box 294-ME.

COMPLETE CONTRACTORS EQUIPMENT

Offered for sale by Southern contractor. Priced to sell.

7—Railroad Type Steam Shovels 2½ to 5 yd.
3—Full Revolving Shovels ¾ yd.
1—Gasoline Clamshell Crane ½ yd.
2—Jordan Spreaders.
2—Locomotives, 26 Ton, American Saddle Tank
32—12-yd. Western Heavy Duty Dump Cars
3—Camp Cars
1—Flat Car
2—1-bag Gasoline Concrete Mixers
Pumps, Boilers, Jacks and Other Tools

For further particulars, Address **Box 138-ME.**

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Excavating Engineer

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Works: Chicago, Ill.

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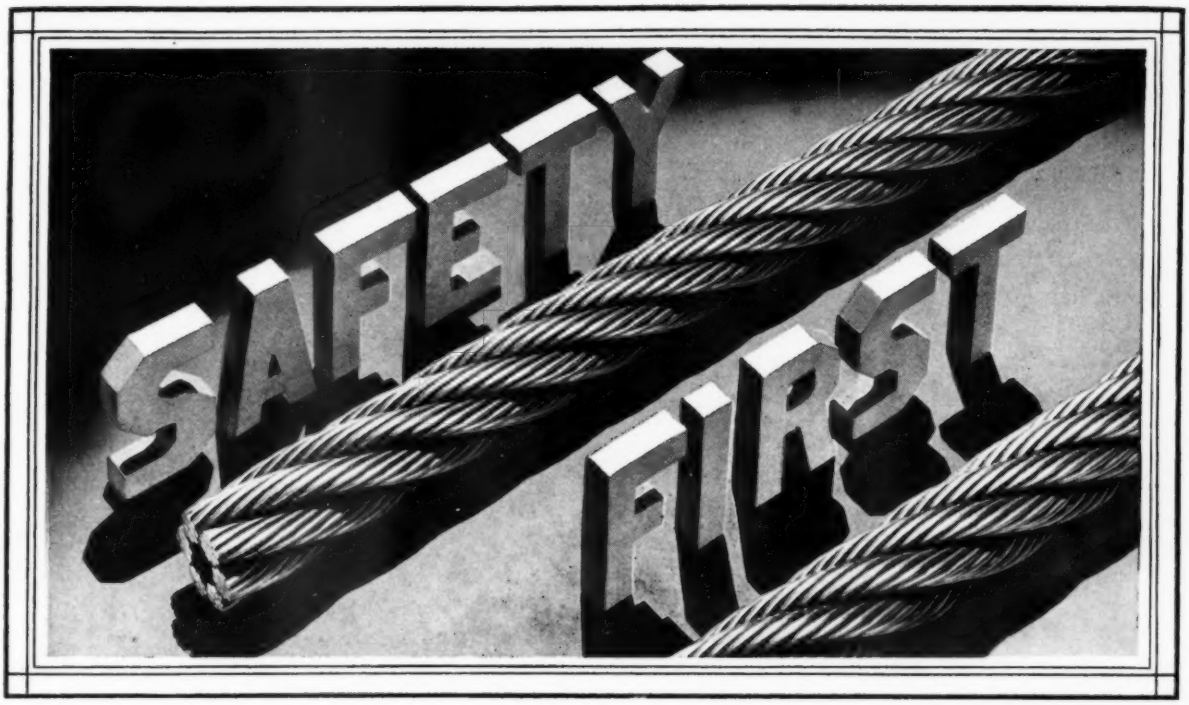

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To insure Roebling Rope of unsurpassed dependability:—

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4. Lastly, recommendations are based on performance-proved facts.

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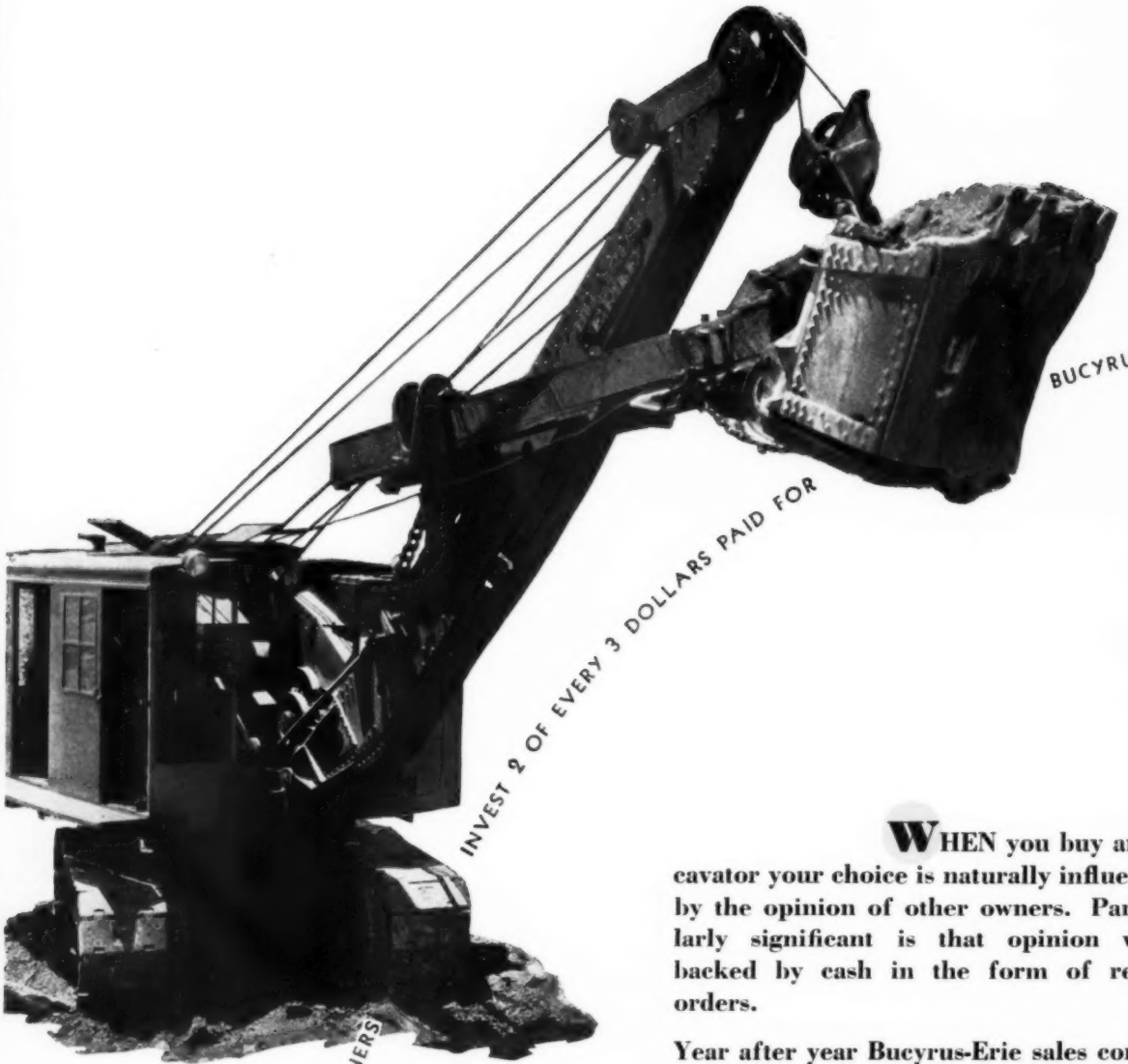

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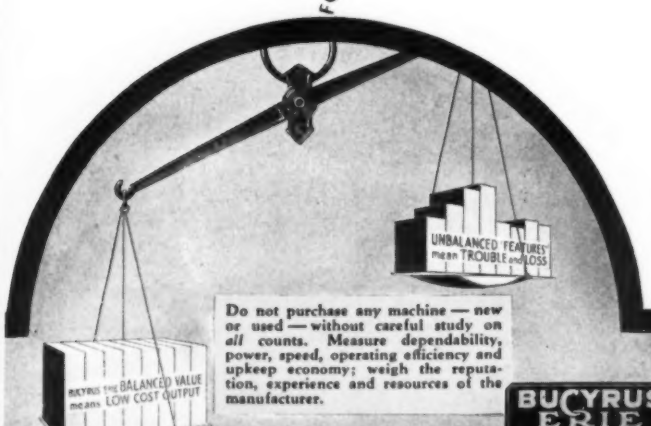
Year after year Bucyrus-Erie sales consistently show that former owners invest two of every three dollars paid for Bucyrus-Erie machines. Of every three machines sold, two go to former owners. So far as we are able to ascertain, this record is unparalleled in the shovel industry. There can be no better proof of balanced-value in equipment than this high percentage of repeat orders.

BUCYRUS-ERIE COMPANY
South Milwaukee, Wisconsin

576



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